Theater Engineering Conference

Floor Coverings

Maintenance of Hard Floor Coverings*

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Summary—**The maintenance of hard floors has many aspects, but this paper will be restricted to telling how floors can best be cleaned, scrubbed, and waxed in order to maintain for them an attractive appearance.**

The term "maintenance" is a broad one that has many meanings. To an airplane mechanic, it conveys the thought of maintaining a motor. To a roofer, it means roofing. To a plumber, it means plumbing.

Even cleaning is not so concrete a thing to talk about as one might think as there are no specifications for it. One can talk of the weight of a rug and the height of the pile, or one can talk of a pilot-tube reading on a vacuum cleaner. But what is "clean"? What standards are there for cleaning? Before trying to clean a floor, therefore, it must be determined what degree of cleanliness is desired, which will be clarified later.

To maintain a hard floor at the highest level of cleanliness, it would have to be covered with antiseptics every time someone walked across it. If, under those standards, anyone had the temerity to expectorate on that floor, the entire building would have to be put in an autoclave.

The author has not had many experiences in maintaining theaters, but has had some which may better illustrate the point about degrees of cleanliness. During the war, the author's company was called to Oak Ridge, Tennessee, as consultant on maintenance. Among other things, they were struggling with a problem in a small motion picture theater there. The last row of seats was flush against a beaverboard

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partition. Right behind and above each seat was a large grease spot from the heads of people who sat in this last row and naturally leaned backward.

"We use this theater Sundays for church services and the lights are on," they said. "It is quite unsightly to have these smears behind each seat. How would you suggest that we clean them?"

Beaverboard is very porous and hence resistant to solvents. It is not only difficult to get oil out of beaverboard, it is practically impossible. It was, therefore, suggested that a good quality mineral oil be used to wipe the whole beaverboard partition. The problem was solved not by removing the spots by cleaning, but by uniformly dirtying the wall.

Thousands of stores and other establishments that have light-colored hard floor coverings furnish another composite example. They are swept daily but mopped thoroughly only once a week, probably on Saturday night. Bright and early Monday morning the floor is beautifully white or light, then it starts to tone down and down until about Friday it is a pleasant-looking gray. The floor has been maintained reasonably. Extreme measures have not been taken to clean it, but proper health safeguards have been taken. True, these floors are not antiseptic, but no one expects them to be.

A curious thing about floors is that after many have been dealt with it will be discovered that each develops a personality of its own. Identical terrazzo floors put down by the same company in the Pennsylvania Station and the Museum of Modern Art are as different after the passage of a little time as a dead-end kid and little Lord Fauntleroy. One has been toughened and hardened by the carelessness of rushing, shoving thousands of careless commuters and travelers. The other remains dainty and ladylike as though blooming tenderly in response to the careful, gentle tread of art lovers with time on their hands.

The same may have been found in theaters or movie houses. In one section of town, the theater will be genteel because its frequenters are respectful of property. They might even be people who would not think of throwing chewing gum on the floor, certainly not without first wrapping it in paper. But in another part of town one might be lucky to have the seats still attached after a Saturday matinee attended by young ladies and gentlemen of teen age and less. Here the floors will reflect a far different personality, possibly one hardened even to bubble gum.

Then, there are climatic factors which strongly affect the personality of hard-covered floors. The same floors in Montreal in the winter and in Palm Beach get different treatment, therefore have to be given different treatment in cleaning. In cities where there is snow on the ground most of the winter, it is necessary to cope not only with snow brought in, but with salt and snow which are tracked in, and must be cleaned differently than the light dust which is the most found at Palm Beach.

With the foregoing factors in mind, the one thing which will help most in solving some individual floor problem is the cleaning compound used. Irrespective of whether cleaning is done manually or by a scrubbing machine, the cleaning compound used will determine the efficiency of your operation.

To be more specific, the detergents or sequestering agents in a cleaning compound will determine whether cleaning is efficient and inexpensive or inefficient and expensive. The better the detergents, soap powders, or particular compounds used for a particular job the less will be paid for manpower or the less the electric bill will be for using a scrubbing machine.

It has been found in maintaining many floors that the greatest efficiency is obtained by the use of properly compounded materials, usually custom-compounded for particular types of jobs.

There are all sorts of cleaning compounds, such as soaps, on the market. They are all good for particular purposes. But none are good for all purposes. That is why care must be taken to use the right cleaner for the particular type of floor covering to be cleaned.

The way surface-reducing agents or water softeners (the compounds mentioned above) work, is as follows. The man with the mop spreads out the water containing the cleaning compounds, which should reduce surface tension, dilute the dirt, and begin to float it off the floor. If the compound does its work properly and softens the water, the mop slips easily and the worker accomplishes more. If the compounds are wrong, the mop lacks an easy slip, the man works too hard, and accomplishes less.

Among the best bases for many cleaners is trisodium phosphate. As a matter of fact, it is a very good cleaner in itself. But it is strong and must be used with care because it is also a good paint remover. If the workers are not careful and splatter it against the wall, the wall paint starts peeling off.

Also when trisodium phosphate is used, it must be buffered carefully to prevent crystallization. When this phenomenon occurs and the compound goes out of solution, crystals are formed and remain in the cracks of the floors. This crystallization develops great force, and will chip and spoil your floor.

Aside from finding the right compound, the next important thing is to buy mops with care. The average user will call up and say, "Send me a mop stick." There are five-foot mop sticks and seven-foot mop sticks. To bring costs down, get the long one. It is obvious that a man swinging the longer mop covers more ground over a wider arc and gets more done quicker.

The maintenance of composite floors, such as asphalt tile and linoleum, is a very large field, and much can be said about it. One must be very careful with asphalt-tile floors. Too many floors have been ruined by using the wrong type of wax and solvents. Asphalt tile has become very popular. It is made out of the end products of the destructive distillation of petroleum, and hence soluble in most organic solvents.

When a floor of this type is waxed a water-emulsion wax must be used. Carbon tetrachloride, for example, cannot be used to take out stains as asphalt is soluble in this and other organic cleaners. These floors can be hardened by mopping with just salt water. Bleeding, meaning the colors starting to blend together and becoming a sort of amorphous color rather than a well-defined one, can be stopped by using certain acids. Vinegar has been found to be an excellent acid for the purpose and easily obtained.

Marble floors present other problems. For example, a very strange thing happened at LaGuardia Field when the author's company took over the maintenance of the International Air Terminal. It was found that the floor became dirty quickly. It was a nice, red Tennessee-marble floor that had been treated so brutally that it was white, bleached: Too strong detergents had been used on it, and when a marble floor is too clean, the first person who walks on it leaves marks. It was necessary to dirty the floor a bit to bring it back to its nice red color.

Red Tennessee marble is a very common floor covering in lobbies. It should be pinkish, and the way to get it pink, if it is white, is not to wash it for a while, just let it get good and dirty. If it is desirable to keep up the appearance a bit, wash it with water only and mop it. As a matter of fact, this is an excellent way to clean a floor. If enough

water is put on a floor, most of the dirt will float off. Of course, the surface-tension reducing agents in water softeners help.

Some may ask why all this fuss about mopping a floor. This is perfectly natural if you have only small areas and little usage with which to contend.

Maintenance and cleaning always have been the forgotten and neglected factors in most business operations, but in recent years, there has been a decided change-over from the assignment of misfits and failures in other departments to the maintenance and cleaning chores. Business executives have found that it makes a decided difference in the profit-and-loss columns if maintenance problems are handled with as much thought and research as are given to other business problems.

Therefore, with regard to hard floor coverings, have an intelligent person carefully study your cleaning operations for three or four days. Have him check the cleaning compounds used to be sure that they are the right ones for the type of floors. Make sure that the mops and other equipment utilized are as efficient as possible and better floors and a less-expensive operation, irrespective of the area you have to keep in condition, will result.

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Note: At the request of Chairman A. Griffin Ashcroft, all discussion was held until the sixth and last paper in this group was presented. The material that follows, therefore, is in the nature of a panel or round-table discussion.

Discussion

Mr. Wade: Mr. Beckwith, I am interested in knowing a little more about the qualities of this rubber lining. The name "sponge" is used, and that to my mind brings up the natural sponge which is quite water-absorbent. I imagine the name was just accidental rather than well thought out. I believe, from your description, this material is not water-absorbent. Is that correct?

Mr. O. P. Beckwith: I am not a rubber expert, so I cannot answer that, but I think the gentlemen from the United States Rubber Company can. I do not believe the sponge rubber absorbs water at all like natural sponge which we get from the sea. It is just a term used to describe the structure of the rubber itself which does look like a sponge. But I do not think whether or not it will absorb water would be too much of a problem in a theater, do you?

Mr. Wade: In general, no, except for areas around water fountains where you might get a little splash, and then pass the water into the base of the rug.

Mr. Lloyd Jantzen: Answering your question as to the reason the word "sponge" is employed, that has probably been in existence for 25 years. Sponge rubber as such was developed in Europe about that number of years ago, and the structure of the stock itself appears spongy, similar to a marine sponge. It has a tendency to absorb moisture.

This particular class of sponge is highly absorbent (referring to foam rubber). The class of sponge that is used for undercarpets is only partially porous, within the stock, but as I stated earlier, the surfaces are impermeable, which means that they are absolutely airtight. No water can pass through the surface.

They can be cleaned. We do not recommend that they be swabbed by pouring water too freely on them, but they can be cleaned with a damp mop. You will find that the water will remain on the surface, and not go into the sponge in this undercarpet sponge. However, if this were used (referring to foam rubber), we do not, of course, recommend this. I only brought this along to show the contrast between foam rubber and sponge rubber. This material is used entirely for seating, mattresses, and pillows, because it dissipates body heat completely and entirely. That would not be a practical product for carpet cushioning. It does not have the tensile strength that the other does, nor does it have the abrasive resistance that this has. This is designed for the undercarpet job.

Mr. Wade: In some of these sponge or foam rubbers there is a sort of recovery time. Whereas I do not think there is any actual flow of the material, there seems to be a sort of viscosity associated with some of the sponge or foam rubbers. Is there anything like a viscosity constant of any value associated with this material used in undercarpets?

MR. JANTZEN: I have never run across anything like that.

MR. WADE: Does it recover practically immediately from any deformation?

MR. JANTZEN: That is correct. It is merely a case of taking a steel plate and putting the rubber on it and pounding it for all you are worth with a hammer, and its recovery is immediate and complete.

MR. ZARO: Mr. Savoury recommended that rubber floor coverings not be laid on grade since I inferred no cement has been found which will retain the rubber to a cement slab on grade. On the other hand, Mr. Jantzen, in discussing the sponge-rubber underlay, made mention of fastening the sponge rubber to the surface with an insoluble water cement and binding the edges.

We have done a lot of experimenting and I have had considerable correspondence with your company on just this sort of thing. I wonder if you can explain that point to me.

MR. JANTZEN: Your question has to do with the type of bonding agent to use for bonding the sponge rubber to a cement floor?

MR. ZARO: That is right.

MR. JANTZEN: My experience has shown that the usual water-soluble type of glue employed for cementing linoleum to floors is also satisfactory in applying this to cement floors as well.

MR. ZARO: Actually we have used at least ten different types of adhesives and in each case eventually the rubber has crept. That was another question I wanted to ask. How actually could you prevent the rubber from creeping? You made mention of the fact that the rubber would grip the carpet, but in using a rubber underlay or floor covering in an aisle, where you have a certain amount of elevation, you do get a great deal of creeping. So far no one has ever explained to me what I could use or what could be used to eliminate it.

MR. JANTZEN: That has been one of the features of bonding the quarter-inch sponge rubber to the floor and then placing the carpet immediately over it, anchoring it at the edge in the conventional way where you anchor your carpet to the floor with the studs in the usual fashion. The nature of the sponge rubber is such that usually it does not skid on any kind of smooth surface even if not bonded. I do not know how to demonstrate that to you. Let us take a sheet of steel for example. You cannot make the rubber skid. As a matter of fact, this materia in three thirty-seconds of an inch is usually sold as a nonskid underlay for scatter rugs. It serves no cushioning value. It just serves as a nonskid agent.

MR. ZARO: I can understand that on a flat area, but where you have an area where you have a definite incline, you do get a certain amount of creep in the rubber itself.

MR. JANTZEN: You mean if the rubber were cemented to the floor?

MR. ZARO: Yes. We have found that the rubber will not stay cemented to the floor.

Mr. JANTZEN: That might be entirely due to the cement that you have used.

MR. ZARO: Can you recommend a cement since I have not been able to find one yet?

MR. JANTZEN: I think so.

MR. ZARO: Then may I go back to Mr. Savoury to ask if you have found a cement which is satisfactory, why you do not recommend using the rubber sheeting that you mentioned or the rubber tile on slabs which are not on up grade.

MR. TOM SAVOURY: We are talking about two different things. I mentioned the fact that it is not recommended to apply any hard tile; what we call a hard tile is a sheet-rubber flooring or a blocked tile or below grade. Actually in the industry we have not found a cement that would keep the flooring down for any length of time that would be profitable to use it that way.

Probably there is a way of attaching sponge undercarpet padding for the purpose, but they are two different problems. Is your problem one of keeping the sponge underlay, where you have a carpet, in place or is it to put down a rubber flooring such as a sheet flooring or a tile floor?

MR. ZARO: It seems to resolve itself into the same problem, in that the rubber sponge will not adhere to the floor.

MR. SAVOURY: Probably Mr. Jantzen can amplify this a little better. So far as we are concerned, wherever we are required to apply a rubber flooring, one that has no relation to carpets or to sponge, whenever the areas are on or above grade where there is no space underneath it to aerate it properly, there is no cement on the market that will keep it down. That is quite positive.

MR. ZARO: I realize this is very costly, but it has been recommended to me to use copper sheeting between the slab and the rubber. Do you known whether or not it actually is successful?

MR. SAVOURY: Yes, we have installed several jobs in Florida. My company has actually put down slab copper that is very thin; I believe it is called an electrolytic copper. That is put down with an asphalt emulsion, and over that is cemented the rubber flooring. That can work, but it is really a very scientific and difficult job to install, but it has been done, and it is kept in place.

MR. LEONARD SATZ: Mr. Smeallie mentioned that humidity control is desirable in the preservation of carpet. That is, controlled humidity. Am I correct in assuming that?

MR. JOHN SMEALLIE: Yes.

MR. SATZ: Do you understand that the majority of our air-conditioning systems are not centrifugal-type cooling systems, in that we use well water? For that reason, we remove as much humidity from the air as possible in order to introduce comfort into the auditorium. We do not have true air conditioning, really, in the average theater installation in that we do not return through the air a proper or controlled amount of humidity. We remove as much of it as we can. Under those circumstances, I take it the air-conditioning system means nothing in the preservation of the carpet.

MR. SMEALLIE: It would not add anything. In wool the water content is great and the variation probably up to one fifth of its weight. You can see how quickly the lack of density would allow for wear.

MR. SATZ: Is there a greater weight of wool per given area for a five-frame Wilton than there is in a three-frame Wilton?

MR. SMEALLIE: That, of course, would depend upon the height of the pile.

MR. SATZ: All factors being equal.

MR. SMEALLIE: You get only one yarn in the surface to form the pattern, while the others would lie buried in the body and the back, and the more frames you add the more varied your surface yarn.

MR. SATZ: How about the weight of the wool, the weight of the yarn in the given area of carpet, pitch and height of pile being equal?

MR. SMEALLIE: The more frames you use the more would be buried, because each frame is not used in the surface to effect the pattern. The others in turn would be buried in the full warp length.

The only thought I want to convey there is that the yarn used in the pile surface has the greater length. The buried yarns would only run the straight length of the fabric, but for every frame added you would add to the wool basic weight in the body, and the back of the fabric. That is why so many carpets in the Wilton field would be, say, two and a half or three and a half frames against perhaps a household quality that might be considered practical in a full six-frame. If you can accomplish your pattern, not bury too much surface yarn, and make it up perhaps with a lesser cost in your stuffer yarn, you would accomplish the same thing and would have relatively less wool weight in the per yard or similar specifications.

MR. SATZ: Would you consider it important, in so far as wear is concerned, that most of the weight of the yarn in a five-frame Wilton would run underneath or through the backing, as compared to a carpet that has most of the pile above the backing?

MR. SMEALLIE: I do not think there would be great added wear value, except it is a softer yarn than those generally used as stuffers. You must have a definite amount of body and so-called stuffer warp, but I think you could readily get beyond the practical side if you wanted to get a full-frame fabric without accomplishing the design.

MR. BECKWITH: In the Wilton weave, as was brought out by the comments that have passed between Mr. Satz and Mr. Smeallie, in order to achieve pattern effects, the amount of yarn used in the surface will vary. In a five-frame Wilton, the yarn used in weaving the pile surface will be greater than in a two-frame Wilton; however, the amount woven into the nap or surface remains the same. Thus, as the number of frames increases, the proportion of the pile surface yarn to the total pile yarn decreases, and, in the case of a five-frame Wilton, runs approximately 50 per cent.

On the other hand, in other weaves, such as the Velvet and the Axminster, you have about 95 per cent of the total yarn appearing in the surface. It has been our opinion in the Smith mills that the amount of wear that is obtained is not very greatly affected by the amount woven into the back as occurs in the Wilton, but I think there probably is some cushioning effect.

CHAIRMAN ASHCROFT: In connection with Mr. Satz's question on humidity, it might be commented that the experience of the testing laboratories has indicated that the wear life is increased as humidity rises; that is, as the amount of moisture in the air is increased. This is in nearly direct proportion, that is, it is a straight-line picture. We are comparing in these instances dry indoor winter heating conditions and moderate humidity, not high humidity.

I should hazard a guess that the average theater humidity probably does run up around 40, 45, 50 per cent, even when the moisture is relatively removed by the system, and in that case I think Mr. Smeallie's comment is justified. If it ran at 20 per cent humidity as may exist in the average home, you would have a distinct difference in life.

MR. JAMES FRANK, JR.: Apparently one of the places where carpet wear is most serious in the theater is on the stairs, and Mr. Beckwith told us about the

fact that wear depends to a great extent on the density. And yet on the stairs we normally take the same carpet that we put elsewhere in the theater and we bend it over so that we obviously are materially reducing the density on the edge of the stair tread where the greatest wear occurs.

In one of the Society's committees we have talked about this for a long time, but just to get it on the record, I should like to know whether any consideration has been given or can be given to a special type of carpeting for the stairs with a much heavier density, so that when it is bent over it still will give the same kind of wear that you would get on the flat surfaces in the theater.

You might also comment on preformed carpets for stairs, so that if it were practicable for the sake of economy you would have your very heavy density in certain portions of a 27-inch strip of carpet where it would be bent over and the rest of it would be the normal density.

MR. BECKWITH: It is possible mechanically to do what you say, to weave a carpet of different density which might be so woven as to fit the contour of the stairs and to have at the edge of the stairs areas of varying density, but I think the cost of making such a carpet would preclude its use in theaters.

Then, your first point about using a carpet on the stairs of differing density from that on the other surfaces, or one which would have a density at the nose equivalent to carpet on the level can be answered by stating that I think most manufacturers have several grades of floor coverings which might be suitable for different conditions of theater use.

For example, we have one particular grade that is used in many theaters, but we also have another grade that is even higher in density, and it would seem to me that your problem would be to place on the stairs the carpet of higher density and on the level, the carpet of lower density.

MR. FRANK: That is an answer, providing that one of two things is done. Either that the theater owners are convinced that a special pattern is required to minimize hazard on the stairs and therefore that the pattern of the carpet on the stairs has no relation to the other carpet, or that the same pattern is available in both qualities of carpet, so that if a man wants to forget about the hazard problem or considers that it is not serious, he can have uniform design in both places. I do not know that that has been done so far as regular pattern carpet in the theater is concerned.

MR. BECKWITH: It is perfectly feasible to do exactly what you say, to have this higher density or higher wearing grade of the same pattern exactly as that used on the surface. It is wholly a question of merchandising and sales. If sales wants to do that, and they have enough demand for it, they do it, and if the problem exists in large enough areas to warrant it, they will do it.

MR. FRANK: I do think that perhaps conferences and discussions such as this may help to create a demand for that if it is the right thing to do.

CHAIRMAN ASHCROFT: As I recall it, the noses of stairs and the location of the wearing surface, where it is the most severe, is at the start of the curve downward and never very far on to the maximum curvature. Therefore, I should hazard the guess that the difference in density occurring there is a very small difference at that particular point, granted that at the exact nose, the outer nose, it is considerable.

MR. FRANK: That is all right, but then I would say that the heavier density would still probably give longer life on the stairs itself, because it is where your

foot hits the floor on the step, I grant you, that you get the greatest wear. Is it not true that if you had heavier density you would have longer wear?

Mr. Beckwith, can you give us, as the result of the test you discussed before very briefly, some very definite recommendations as to the best method of installing carpet on stairs? There is quite a variation. We have, as everybody probably knows, a number of different ways of attaching the carpet to the stairs, but it seems to me that there must be one or two recommended methods, and I think we ought to have that in our records, too.

MR. BECKWITH: We have had some experience with stair-carpet installation in theaters, and it has been our opinion and our recommendation as the result of these studies in several theaters in the metropolitan area, that in principle we should use approximately a 64-ounce felt-hair underlay. This would be used on most of the tread portion of the stair, and then at the area covering the nosing, we would have a few inches of sponge rubber. We have used products of different manufacturers, du Pont, for example, and Sponge Rubber Products, and we would recommend a strip about two or three inches in length which would be cemented on the tread of the stair, and the sponge rubber would then overhang the edge of the nose.

We have used linoleum cement for fastening the underlays in those installations, and then the carpet is laid over that. In some of the installations where we have run experiments, we have seen used an oak slat which is fastened to the stairway—this happened to be a marble stairway that I am thinking of now—and that was fastened by appropriate expansion nuts. Then the carpet was fastened to that tacking strip or slat, and no underlay was used on the riser portion.

This particular installation which we considered a recommended installation for one involving severe traffic, had the carpet fastened on the tacking strip not by the use of the customary carpet tacks but by the use of screws and washers, rather small ones, and not unattractive in appearance.

With such an installation, of course, you have the area of the carpet that receives the most wear protected by the most resilient and longer wearing underlay, that is, the sponge rubber, and you use a minimum amount of the sponge rubber, because the sponge rubber costs more than the other types of underlays. Therefore you would not use it for covering the whole stairs, particularly in the balance of the tread, where the 64-ounce felt will do just as well.

With such an installation, you have a very permanent fastening of the carpet. No doubt it has been the experience of many theater operators that stair carpet fastened in the conventional manner, that is, tacked to the tacking strip, oftentimes pulls away, and in that case you have looseness developing and a potential hazard.

In general we should recommend the use of sponge rubber at the nose in minimum amount, the use of 64-ounce felt for the balance of the tread, a very adequate tacking strip, and a very good fastening to the tacking strip.

CHAIRMAN ASHCROFT: Do you wish to mention provision for moving the carpet in order to get the greatest economy in use of the carpet?

MR. BECKWITH: I rather took that for granted, but I believe it should be standard practice anyway in the installation of carpet on the stairs to leave enough at the top so that as the carpet covering the stair nosing gradually wears out,

you can then shift the carpet so that the area which was on the nosing is then moved to the point of intersection of the tread and the riser.

MR. JANTZEN: What did you have in mind in relation to the difference in thickness between the 64-ounce felt and the thickness recommended according to your ideas of the sponge rubber on the nosing, where you evidently splice the two products in order to abut them or overlap them? In other words, in 64-ounce you probably would be resorting to about a half-inch thickness of sponge rubber to balance in with that thickness of Ozite or felt. Is that correct?

MR. BECKWITH: Yes, we should use a one-half-inch sponge rubber approximately, and that is perhaps a little bit thinner than the 64-ounce felt, but with a little traffic the condition is equaled out by the 64-ounce felt diminishing in thickness.

MR. JANTZEN: Mr. Beckwith mentioned something about a firmer density of sponge rubber. There is available for stair nosing a sponge rubber in a firmer density than is used elsewhere, perhaps, as an underlay, and if there is any advantage to a firm density of sponge rubber, that is available in any thickness ranging from three thirty-seconds on up.

MR. SMEALLIE: I should like to volunteer the thought that for better types of theaters or theaters with large budgets, it is very possible to use the Chenille weave and break it the wrong way. Chenille is an Axminster weave with the cross rows very much pronounced, but if you order it the reverse way and break it with the weft direction, you see you have a remarkable edge standing a great deal of wear through the sense of the density factor that has been brought up. There is a very pronounced advantage in it. Different weights of Chenille for some of the larger and finest hotels and theaters have been accomplished, and according to price, it costs about 10 per cent more to weave it so wide and so short in length. The minute you have a width of, say 30 feet, and only weave it three feet long, there is an added cost in production, as you might see, but it is a very valuable suggestion in a better budget situation to order the Chenille in the reverse fashion, order the length with the width and break it where the weft is shown here against any ordinary opening of the usual carpet form.

MR. FRANK: To my surprise I ran into a theater owner who almost insists that we install carpet in the standee portion crosswise and bind it to the carpet lengthwise that runs down an inclined aisle. I think that it ought to also go on record as to what is the proper way of installing carpet in the auditorium, and the reasons for it, if Mr. Beckwith would be good enough to tell us that.

MR. BECKWITH: I am not too familiar with that problem. The standard practice in the standee portion is to have the carpet laid lengthwise to the length of the house, is it not? We have no real data in the laboratory as to the effect of wearing of the carpet across the surface in the manner that you are talking about there. I do not know whether it will affect wear so much as it will affect the appearance.

Laying the carpet crosswise to the direction of traffic might, it seems to me, result in these troubles with shading of which anyone familiar with floor covering is aware. Whereas, if the carpet is laid so that its lengthwise direction is in the same line as that of the traffic, you would not incur those troubles in shading. That is just a guess on my part.

MR. PAUL GARST: The most desirable method of laying the standee carpet is to follow out the aisle wherever possible. However, in numerous installations it is

more feasible to treat the standee separately and in this case it is necessary to butt-joint the aisle carpet to the standee carpet. We fully appreciate that this explanation is not concise enough but, on the other hand, we must bear in mind the peculiarities of each theater. Very often by extending the aisle where the standee is narrow it runs to quite a loss in matching. This calls for extra carpet, the initial cost of which is very high, and thus increasing the over-all cost of the installation. By treating the standee as a separate room, using the width for the length much of the waste for matching is eliminated and if a careful butt joint is made the wear should prove very satisfactory.

A friend of mine in the theater business who has had a great deal of experience with carpets brought up the subject about surface shampooing, and so far no one has mentioned that.

MR. BECKWITH: We are considerably interested in methods of care and maintenance of floor coverings, and particularly in the problem of taking care of floor coverings that are wall-to-wall installations and that cannot be removed and brought to the rug-cleaning establishment for cleaning.

Cleaning in a cleaning establishment is the ideal way to take care of floor coverings, because the floor covering there can be treated with soap and brushed and thoroughly rinsed and washed out. You cannot take up carpet that is tacked down wall to wall, and when you clean it in a wall-to-wall location you cannot apply soap indiscriminately and rinse it out and remove it.

If I talk first about the difficulties of floor cleaning it may be helpful. The application of soap to the pile of the fabric represents a difficulty in wall-to-wall location cleaning, because you cannot adequately remove it, and if you do not adequately remove the soap that has been deposited by the cleaner, then you are liable to run into trouble, because the soap fats that remain may cause rancidity, and they may cause very rapid accumulation of soil after the cleaning so that the carpet will look worse in a few days after cleaning than it did before.

The second problem in floor cleaning is that too much moisture will be deposited onto the fabric so that the back wets out. Mildew may develop, particularly in the summertime, because the carpet cannot dry out readily because of high humidity.

The cleaners and the manufacturers of soaps and detergents have done considerable work toward improving detergents and soaps, and it has been our experience and I think that of the rug-cleaning industry as well, that the use of synthetic detergents rather than the natural kind of soaps gives a much better cleaning job.

One reason why it does that is that with most of the synthetic detergents, if the water that is used is hard, you do not get the mineral materials in the hard water precipitating out on the pile surface, and leaving a scum. With soaps, the mineral matter constituting the water hardness is precipitated out and a scum is left on the surface, which, although it may not readily be apparent, will cause rapid resoiling. With synthetic detergents, that does not happen in general.

CHAIRMAN ASHCROFT: The problem of on-location cleaning is one that the industry has recognized as a very difficult one and for which there is no perfect solution.

Not only the carpet industry but the cleaners themselves are beginning to become aware that they should help to solve this problem. Consequently, during the last three months, a committee of the New York Rug Cleaners Institute and the Carpet Institute's Technical Committee have met together to lay out a

program of research which will perhaps give a satisfactory answer to on-location cleaning. I do not know how soon that answer will be forthcoming. They are conducting independently and together a series of experiments. The Committee is cleaning the carpets in the Institute offices by several different methods to collect exact data as to the effect of these different cleaning methods and detergents that are used. The Rug Cleaners themselves are also conducting research to see if they can set up a system sufficiently satisfactory to recommend it to theater owners and public-building carpet cleaning.

The two precautions Mr. Beckwith has mentioned are valid, however. If you must clean on location, do so with a synthetic detergent which does not leave the soap fats, but leaves a deposit; perhaps, that is less serious, more innocuous to resoil, and also requires less wetting out of the pile underneath the surface.

There is one caution which you might keep in mind, and that is that the soil which you are removing is on the surface, it is not down in the pile. Along the lines of Mr. Fraad's comments, you can do a surface job that is reasonably satisfactory, but it requires study and care and special techniques.

MR. DANIEL FRAAD, JR.: We obtained very poor results from on-location cleaning of rugs. We have done a few things, though, that possibly could be made applicable to the theater owner. In connection with the runners of airplanes, we take them out and instead of vacuuming them we blow through them. We have found that that is a very satisfactory way of cleaning. The rug is reversed over a grating and compressed air is forced through the back of the rug out to the grating, the vacuum attachment sucking away the dust. That method is also used in Pullman cars.

Certainly, from a cleaning standpoint, I should like to see large areas of carpeting put down so that they can be taken up readily and cleaned. We find in cleaning rugs that the most difficult thing, if you have to put water and soap on them, is to get it out. It always gets down in, and the resoiling of the rug is so much more rapid that you are better off to leave it dirty.

CHAIRMAN ASHCROFT: Mr. Smeallie mentioned a newer type of installation which makes possible the removal with greater ease of the carpet (these tacking strips), and that is something that perhaps might well be investigated in certain areas where traffic is heaviest. It might be possible to remove the carpet with greater ease with this particular method which does not employ tacks or screws through the carpet, but catches the carpet from underneath with protruding brads which makes possible, by a stretching process, the pulling off and replacing of the carpet.

MR. M. J. FESSLER: In connection with your remarks about the Carpet Institute carrying on the investigations for cleaning carpet, I might offer a suggestion. I think it devolves itself more to a mechanical as well as a cleaning agent, and if the Institute could devise a unit that will use a solvent, that could be pushed across the floor, as you do with a scrubbing machine, we would have something which would leave the carpet clean and last for possibly a year instead of maybe a week.

In the course of Mr. Fraad's remarks, he spoke of soap as not being the ideal cleaning agent because of the fact that concerns like Armour and Wilson and other people who sell beef have a surplus of fat and so get fatty acids which are saponified into soap, which leave, when used, a thin film on the surface.

Mr. Fraad, what has been your experience with the vegetable oils as a

substitute? Have you used any wetting agents in connection with your cleaning? Have you also had any experience with such products as Nacconol or Santomerse? Most of us understand that cleaning with a detergent or a soap primarily involves lubrication and flotation, and in order to obtain an ideal cleaning job, we must have something that will penetrate the soil. In these last few years these wetting agents have played a great part to reduce labor in the factor of cleaning.

MR. FRAAD: First of all, so far as the wetting agents are concerned we use sodium polyphosphates in quite a few of our compounds. It is very important but it must be tempered. You can get too much wetting agent in and hence you lose slip. You have to look for the compounding to an organization that will compound something that fits your purpose, but you should look for wetting agents and surface-tension reducing agents.

As a matter of fact, for the whole idea of cleaning, we take a soap as we know it. If we saponify a fat or a fatty acid, we get a soap. I do not say that soap is not good, but I have found that in commercial operations the ordinary saponified oils are inferior to the wetting agents, and the surface-tension reducing agents. The action of soap is more of an emulsifying reaction rather than a surface-tension reducing agent, which the wetting agents, such as trisodium phosphate, are.

We do use sulfated oils and we find that sulfonated oils are very good. However, their cleaning action is very strong. You can bleach to a point that you have cleaned too much and that is as dangerous as not cleaning enough because the aesthetic effect is very bad. However, you are perfectly right in saying that there are certain oils that they are using to great advantage.

MR. FESSLER: Do you use the sulfated fatty alcohols at any point exclusively, or do you use them in conjunction with vegetable-oil soaps?

MR. FRAAD: We do not use them in conjunction with vegetable-oil soaps. What we do is to take a compound like Orvus, which is put out by Procter and Gamble, and which is, I think, a fatty alcohol sulfate. We add trisodium phosphate to it and work that way.

CHAIRMAN ASHCROFT: You might be interested in a test that was developed in the laboratory to evaluate the resoiling factors of different fats, fatty acids, soaps, and synthetic detergents by casting them out in thin films, that is, evaporating them out on plates, so that what might be considered the minimum deposit of film was left, and then studying the action of that film against powdered charcoal, or carbon black, in its retention of that soil, by blowing it over it and then removing it by blowing or air pressure.

We found a distinct difference in the adherence of carbon black, at least, if not various other soils, to these different films, and there is no question but that the natural fats have greater adherence than the synthetics.

MR. ROBERT SCHMID: There are many means of sewing carpets, and the problem which I should like to bring out for the concern of the carpet manufacturers is that in the manufacture of long-pile carpets today there is a tendency to clip the side wall and leave a void space at the edge. The machine-sewn carpets have a tendency to try to pull this carpet together in order to make up for this lack of wool. What happens is that you have a hard or inflexible joint at this place, and I think if you will observe various carpet installations, you will see that their wear is at the seams in a great many cases, and I think it is due to that fact. Have the manufacturers anything to say about that?

MR. BECKWITH: I should not attribute the wear at the seam to the fact that there is a clipping of the pile or pile left out as you say at the edge. I attribute this wear at the seam to the fact that in the sewing operation you tend to create a slight ridge in the surface so that the pile of the carpet right at the seam is always slightly higher than that of the surrounding surface, and therefore when people walk over it, that area at the seam always gets most of the wear because it happens to stick up a little more.

When I was working for the Army in the Quartermaster Corps, we were very much interested in the wear of Army uniforms, and we found, for example, that in the case of trousers, wear occurs on the fly because of the fact that the cloth covering the buttons is elevated over the rest of the surface, and I think that the analogy holds true there in floor coverings at the seams. The pile is elevated slightly and therefore it receives the initial wear of the foot before the surrounding areas.

You will find that that kind of effect will be duplicated if you have a ridge in the floor. If you have a ridge in the floor, then you will find that the carpet covering the ridge will suffer more wear at that point than in the others.

CHAIRMAN ASHCROFT: Your question was really directed at the manufacturers doing something that would make it possible to have a slower wear at the point of seaming, whether or not that is the major contribution to wear by, for example, increasing the wool coverage at the edges. I think it is common practice to have extra wool at the edges. That is my recollection of the standard practice in narrow carpets. Is that true, Mr. Smeallie?

MR. SMEALLIE: Yes.

MR. SCHMID: I do not believe that is wholly true. If you take a long-pile carpet in a light fabric, and if you take a moderate hand-sewn machine, one that does not exert too much pressure at the joint, and you sew it so you have a flexible joint at that point, that carpet will not match. The point is you are either going to raise a ridge and have the seam close, or you are going to lay the carpet where it will wear the longest and have a line showing.