the building. Certain pests are best controlled by fumigation. Here a specialist is needed, as such deadly gases as hydrocyanic acid, methyl bromide and chlorpicrin, are recommended. Some pests are controlled with contact insecticides, such as pyrethrum and this material plus activators. Such sprays or dusts kill by contact with the insect and have little residual action. Other pests are killed with such insecticides as D.D.T. and chlordane that have a long residual action. Still another group of insects are killed with stomach poisons, such as sodium fluoride and arsenate of lead. The only poison in this group now used in food establishments is sodium fluoride for roach control. Many new organic insecticides are now being introduced, but need further testing before they can be recommended around food plants.

Not only is some knowledge of insecticides important, but also some knowledge of application methods. The use of fumigants necessitates special equipment to insure proper penetration of all spaces and of piles of materials. Dusters and sprayers of many types are available for the different jobs encountered in pest control work. Recently many methods of aerosol and fog dispersion have been developed, but to date have not proven to be too satisfactory as an all-purpose treatment. This method of application gives little penetration, deposits no residue on vertical surfaces, and covers the horizontal surfaces with too light a film to give effective control.

The possibility of contamination of foodstuffs from applications to equipment and premises should be given some consideration. The promiscuous spraying of walls and machinery may permit a film of the insecticide to cover flat surfaces and containers. The treatment of screens and walls outside the processing rooms will usually control such pests as flies, while the careful application of poisons around floors and to the underside of equipment is sufficient for most crawling insects. Some plants, such as in the meat packing industry, require a nonpoisonous material to be used in rooms where food is exposed.

The problem of insect control is of major importance in the food processing industry, for these pests not only destroy the products in both the raw and finished state, but also may get into finished foods as whole insects or as fragments and cause contamination. Every food processor wants to sell pure food products and consequently should see that all pests are eliminated from his plant. Complete elimination of insects is difficult, but the early detection of their presence and an understanding of those factors favorable to their increase, are important steps in control. And, remember that control does not depend upon the proper use of insecticides alone, but on sanitation as well.

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# How Management Can Put Accident Facts to Work for Profit

By RALPH J. CROSBY
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Industrial accidents represent a definite economic loss which can be calculated. In a recent issue of *California Safety News* I read the following as respects the California Canning Industry. "Reliable information indicates that accidents cost the Canning Industry four cents per case for nearly seventy million cases of canned goods packed last year. That gives us an accident expense of almost $3,000,000."

It is not so easy to calculate the value attached to the prevention of personal injury—the value of reducing human suffering—the value of preserving the capabilities and opportunities for men and women to enjoy the advantages of life today.

Accidents within industry are always associated with interference with planned procedures, delay in operations, damage to equipment or product, loss of trained services, in addition to the direct cost as represented by the compensation and medical payments required when personal injury is involved.



The tangible expenses add to the overhead of an organization, and increasing overhead reduces profit. It is good business, as well as an important humanitarian endeavor, therefore, to prevent accidents.

We read more and more about the changing attitude of industry toward accident prevention activities. Industry is recognizing the fact that if plants are operated properly, employees will not suffer injury. Accident prevention is being treated as a part of production effort and not something separate from it.

But the elimination of the specific losses mentioned are not the only economic benefits that the work of accident prevention has to offer. There is the opportunity of improving operating efficiency from many angles if a proper understanding exists and proper use is made of the facts concerning the causes of accidents.

Accidents are the direct result of unsafe mechanical conditions or unsafe working methods. It is generally conceded that the chief cause is that somebody did something wrong.

A clue as to what corrective action can be taken is available if the reason "why" is determined. The answer to this question very often indicates that instructions were misunderstood, or incomplete or not given at all, or the individual just ignored them. In any event the proper corrective measure seemed to be improved supervision, and as a result management today is giving serious attention to ways and means of improving the quality of supervision.

But if management stops at this point in its accident study it is not recognizing factors that will not only prevent accidents but factors that indicate very definitely how a profit can be produced through improved operating efficiency. Although it is true that the great majority of accidents are caused directly by human failure, it is not necessarily true that the only correction lies in the field of personnel improvement.

If management will continue its investigation after instituting emergency corrective measures, it will find that very often the condition can be controlled through engineering revision methods. The facts surrounding the occurrence of an accident if properly used will provide the information necessary to find out where future production may be expected and what should be done in order to avoid them.

Management accepts the fact that it must operate efficiently, if it is to make a profit. In order to accomplish this, it is on the alert for ways and means of reducing operating costs. It is looking for ways and means of providing layouts that permit of more efficient operations, better facilities for handling and storing raw materials and finished products, better lighting, improved maintenance, simplification of work methods and provisions for workers' health and comfort that keep morale high.

That operating efficiency is accomplished through these mediums is evidenced by the headlines in trade magazines. Where to look for opportunities to effect these savings is the problem management is faced with every day. How to find these inefficiencies without making it a major undertaking is the question management is trying to answer.

Let us consider for a moment what the industrial engineer concerns himself with principally. His major objectives are the prevention of waste and reduction in cost. He looks for ways and means of accomplishing work simplification, of improved plant layout, of better material handling, of better maintenance control, of improved supervision. And what does he use as a guide? The truth is he looks for bottlenecks. He looks for the operations or locations where trouble occurs. He looks for evidence of failure of planned procedures. In reality whether he says so or not he is looking for the very things that accompany the occurrence of an accident.

Accident causes can provide you with accurate clues as to where better maintenance is possible; where better design of equipment is possible; where better plant layout is possible; where better handling of material is possible; where better supervision is possible; where simplified work methods are possible and where improvement of employee relations is possible.

Accidents are evidences of inefficiencies, of something gone wrong, of the need for improvement. The causes and reasons why the causes of accidents existed provide management with the necessary facts that will enable it to carry on inside research for improved operating conditions. By inside research, I mean utilizing the facilities

within an organization up to the point that indicates the need for outside expert assistance.

In order to accomplish this, management must look beyond the determination of proximate causes of accidents. Reinstruction, closer supervision or reprimand may be the emergency or temporary repair treatment to prevent the recurrence of an accident. But management should not be satisfied to stop there. If it does, it is closing the door to an opportunity of not only doing a better job in accident prevention but also an opportunity of making a profit through better operating procedures.

It is possible through better planning, through simplification of operation, through better design to eliminate the weakness of depending upon human nature. It is a well known fact that everyone is thoughtless at times. Therefore, in spite of our efforts to control individuals, accidents may occur. Why continue to invite losses and possible injuries if the situation can be corrected by engineering revision of existing method?

Let us consider some of the common types of accidents and their probable causes. Falls are common to all industries. And for illustration we have one in which the employee tripped over a curled edge of a steel plate used to protect wood surfaces of flooring during trucking operations. The cause of the accident may have been determined as failure on the part of the individual to look where he was walking. But there was also a mechanical defect. The curled edge of the plate. Is the answer simply to straighten out the plate and tell the employee to be more alert? Not if we are going to use the available facts to carry on a little inside research. The use of steel plates slows up trucking. Merchandise has been frequently knocked off and damaged when the truck wheels struck the edge of the plate. The plates detracted from the orderly appearance of the plant.

What could be done to improve operating conditions and at the same time eliminate the probability of future accidents? Three things suggest themselves.

1. Use trucks with rubber tires and eliminate the plates.
2. Embed the plates flush in the floor.
3. Establish proper inspection maintenance that will keep the plates in good condition.

Many accidents have occurred because an adequate maintenance system had not been established. As a result, employees attempt to do things that take unnecessary time and which could be done more efficiently by a well established maintenance program and thus eliminate the probable cause of accidents.

For example, employees have been injured because they attempted to erect some temporary scaffold. They attempted to replace burned out electric bulbs or expended fuses. They undertook to make repairs to ladders or portable electrical equipment. And frequently they were caught and delayed operations because they tried to adjust or oil power driven machinery while it was running.

Preventive maintenance inspections would have eliminated these accidents and at the same time preserved operating schedules.

Elevator accidents have occurred because gates on either car or shaftway were not closed. They were left open because the contacts were not working.

Aside from the probability of personal injury, management stands to suffer the loss encountered because of damage to product due to overhang or loss of use of the elevator. All this can be avoided by establishing a proper maintenance program for gates, limit switches and car controls. The need for such programs will be evident to management if they will extend their interest to accident investigation beyond the point of correcting the immediate cause of the accident.

If management is looking for opportunities of cutting cost through better handling of material, a consideration of the accidents resulting from such activities provides the kind of data that will give reliable clues as to what can be done.

Manual lifting results frequently in strains and hernias which of themselves are costly types of injuries. Employees can be told *how* to lift but continuous operations that require twisting, turning, bending combined with lifting will continue to produce accidents.

A plant accident record will clearly show where such conditions are most prevalent. Accidents do interfere with a steady flow of materials which is an essential for maintaining top productivity. In many cases the type of employees used for handling material are in the unskilled classification. But industry itself says that "management must more and more implement the efficiency of its production techniques by converting its unskilled labor into semiskilled labor with power machines to move loads."

I saw an ad in a recent magazine issue which read "A shovel is a luxury. Can you afford such methods."

Management is missing a real opportunity of making a profit if it fails to consider ways and means of eliminating material handling accidents. Much is being accomplished today as respects the control of accidents through supervision and the way stands clear for accomplishing a great deal more when supervisors have a better understanding of the basics of supervision. However, in many instances, effective work can be done both as respects accident prevention and improved operating efficiency by full use of the mechanical means of eliminating hazards.

If a plant accident record shows repeated accidents involving handling material look at the problem not as an accident prevention problem but look at it as an industrial engineer looking for a better way to do a certain job. He considers why must this work be done? What does the job consist of? What can be substituted for the particular operations that cause trouble? Is it possible to change the work procedure? Can mechanical equipment be used to advantage to replace manual handling?

When I read a headline "Fish Zip Thru Hose a Ton a Minute," I feel convinced that some type of conveyor, belt, monorail carrier, moving floor or some type of lift truck should be available to do a better handling job and eliminate the opportunity of employees interfering with production because they suffer strain and hernias while engaged in manual handling.

As I have already mentioned, management considers it highly important from a production point of view that good employee relations be maintained but again accident facts can be of great help. However, the work done in the investigation of the accidents must be complete. It is important that not only the improper performance be determined but the investigator must examine all of attending circumstances and bring to light as many contributing factors or reasons as possible explaining why the employee did something contrary to the right way.

If management will look upon a consideration of accident facts in relationship to operation functions in the same light as a routine physical check up of a person, they will uncover potential trouble spots that can be easily remedied but which could develop into a serious situation if neglected.

As a result of an accident investigation it may be determined that fatigue was the reason for an individual's committing an unsafe act.

Fatigue may be brought about by many things other than lack of sleep. In a recent listing, I found the following possible other causes:

1. Awkward work movement
2. Improper posture
3. Excessive noise
4. Excessive heat
5. Inadequate illumination or glare
6. Noxious dusts, fumes or gases

Once these causes are known, it is not difficult to improve the situation.

Good lighting and the use of proper painting schemes can make seeing much easier.

Push button controls can be installed which eliminate overreaching.

Conveyor lines can be set at a height that is best adapted to seeing the product when the work involves inspection rather than lifting.

If investigation shows that employees are subject to awkward work movements, chances are that some one of the proven principles of motion study has been ignored in the job layout. Are all controls as near to elbow level as possible?

Are there any barriers between the worker and the controls that make for unnecessary motions?

Is the job designed so that all the work is done by one hand while the other is idle?

Herein are ways to improve operating efficiency by maintaining a steady output without demanding greater physical exertion of workers. In addition we have a better employee morale and the occasion for accidents has been wiped out.





I do not wish to give the impression that all of the troubles arising out of the occurrence of accidents can be controlled by application of mechanical schemes that we call engineering revision. Employees are required to follow many established procedures, to adhere to rules, to adopt certain techniques. When they fail to do this, work is spoiled, production is delayed and sometimes accidents happen. Management, therefore, is dependent to a great extent upon its supervisors and very much interested in improving the quality of supervision.

Here again accident facts provide the material that management can use to detect weaknesses and guide it in its selection of what should be done to effect improvement. Supervision fundamentally is the art of controlling the performance of people subject to your direction. An unsafe act may be committed because instructions were not understood, or because they were incomplete or the individual had not been told how to do his job. The individual may have deliberately disregarded instructions or considered them unimportant because the supervisor had failed to give orders with sufficient emphasis or lacked the ability to command respect. In any event, knowledge of the reason why enables management to put its finger on the very thing that must be changed if supervision is to be maintained at the level required for full production.

The prevention of personal injury is a worthwhile undertaking. The prevention of accidents that result in waste time, damage to product and interference with planned procedures is economically desirable.

But if management wants to attain top productivity by insuring a steady flow of materials, by increasing machine speed of operation, by cutting waste time and motion, by improving general working conditions it has the opportunity of doing so through proper use of accident facts. Exploit this data and the result will be an improved operating efficiency which means profit and a more permanent control of accidents.

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## The Safety Work Shop

**(A Panel Discussion on Material Handling in the Food Industries, a Conference Type Meeting on Safety in Manual and Mechanical Material Handling)**

*Presiding:* HOWARD T. BONG, Personnel and Safety Manager, The South Coast Corp., New Orleans, La.

*Discussion Leader:* WILLIAM SCHAEFFER, Industrial Relations Division, Libby, McNeil & Libby, Chicago, Ill.

*Participants:*

KENNETH A. BONG, International Milling Company, Minneapolis, Minn.

FRANK R. FRIEDGEN, National Biscuit Company, New York, N. Y.

LEONARD E. PARKER, J. D. Roseveil Company, Peoria, Ill.

GEORGE H. STEEL, Ralston-Purina Company, St. Louis, Mo.

WILLIAM J. WRIGHT, Beech-Nut, Canajoharie, N. Y.

CHAIRMAN SCHAEFFER: The idea of the conference is to have everything 100 per cent ad lib. There is no preparation. We want to get across not only the safety idea, which all you *fellows* are sold on, but most of all our method of promoting safety.

I know of no other way to get anything across to the human being, either physically, mentally or emotionally, except through conference.

I maintain the way to make people conscious of the physical problems that have to be handled in a plant is to get them in a conference and let them figure the things out for themselves instead of telling them.

We want to get across the physical, the mental and the emotional safety message to our workers and make it a part of them through conference. They will start seeing, thinking and feeling safety.

We can say over and over again: "All right, we can correct all these things. We can put guards on things. But how are you going to get the man emotionally set for this kind of thing, this thing called safety?"

We think we have got the answer in the conference method. Of course, like everything else human, it does not work in 100 per cent of the cases.

Now, Frank, what is the first thing we better do in order to develop a program for solving our safety problems?

MR. FRANK FRIEDGEN: I would say investigate the accidents so that we know how they occurred.

CHAIRMAN SCHAEFFER: Are you saying we ought to highlight those "hot spots" where the accidents happened first?

MR. FRIEDGEN: That is right.

CHAIRMAN SCHAEFFER: George, what is one of the hot spots in this material handling as far as you are concerned?

MR. GEORGE STEEL: Back strains is our hottest spot.

CHAIRMAN SCHAEFFER: Okay, we'll call strains hot spot number one.

How about another one, Bill?

MR. WILLIAM J. WRIGHT: Bumping against.

CHAIRMAN SCHAEFFER: Len, what would you say is a good name for that? Have you got a name for that, something we can remember? How about the thing that happens in streets; isn't that what we are talking about?

MR. LEONARD PARKER: Collisions.

CHAIRMAN SCHAEFFER: Okay, collision. Let's get one more before we go ahead with our analysis and find out what we can do about these things. Is there one more hot spot you fellows want to talk about?

MR. KENNETH BONG: Surfaces; the surface you are working from.

CHAIRMAN SCHAEFFER: Yes, the underfoot condition, that is a big one, isn't it?

How about you fellows—do you want to take the third as slips and falls? After all, you have to move when you are handling this material, don't you?

We want to correct these things before the accidents happen.

What is the first thing we can do to reduce the number of strains in lifting?

MR. FRIEDGEN: I think you should give the proper instructions to foreman and supervisors. If you ask a foreman or a supervisor in one of our plants what is the proper method of lifting, he will get down and show you *how to lift*, but nine chances out of ten he will use the wrong method. So, I think we should start with our foreman and supervisor. They are the key to the whole problem.

MR. PARKER: I think selection is the first consideration. If we don't select the right man for the job, you are bound to run into strains. If you get a big, husky man to lift a bag of sugar or flour, he can do it a lot easier than can some little runt like me.

MR. STEEL: Maybe I am thinking about the extremes. But we have got some little, short fellows in our plants that can go out and outwork the big boys. They have less trouble with their backs and work right along with them.

MR. WRIGHT: I think a thorough physical examination is the first requirement.

MR. STEEL: What are you going to examine them for?

CHAIRMAN SCHAEFFER: What is a big expense in this back business? Further down in the back, what would be a big expense?

MR. WRIGHT: Hernia.

MR. STEEL: No; hernia is on the other side.

CHAIRMAN SCHAEFFER: Back strain is what we are bringing out here in strains.

Can we examine for likelihood to have hernia?

MR. STEEL: About 40 per cent of the population has loose inguinal rings that have a tendency toward hernia. It is an inherent characteristic affecting about 40 per cent of the population.

CHAIRMAN SCHAEFFER: Do they have to lift bags? Do you have to take whoever comes along in this day and age whether they are from this 40 per cent or not?

MR. BONG: I think we should find out about a man's physical condition by giving him a physical examination.

CHAIRMAN SCHAEFFER: We agree then that we must know something about the man's physical condition. Are we doing that adequately?

MR. STEEL: What kind of examination? What are you talking about? Back x-ray?

MR. BONG: I think about the most you can turn up in the examination is to call out the histories.

CHAIRMAN SCHAEFFER: But will the men tell you?

MR. STEEL: No.

MR. BONG: A certain percentage will.

CHAIRMAN SCHAEFFER: How are you going to find out?

MR. STEEL: I don't believe in asking any man on an application blank or in an interview a question that is going to make him lie.

CHAIRMAN SCHAEFFER: He is certainly going to lie about that?

MR. BONG: We should explain to the new worker that the exam is made from the standpoint of proper placement. If I go into a plant with a weak back, and I can't handle 100-pound bags, and I knew by telling the truth I will get put on 50-pound bags—

MR. STEEL: Can you in your plant give him a choice of 100, 50 or 25-pound bags?

MR. BONG: No, but that is an example of placement.

CHAIRMAN SCHAEFFER: Do you agree we have got to use examinations and individual histories to assist us in getting the right man?

How about the question of instruction?

MR. STEEL: I still want to know what the instructions are for lifting. Where do you start bending the knees to keep the back straight? At what weight do you start? Do you start with 5 pounds, 15 pounds, 25 pounds, 50 pounds, 100 pounds, 200 pounds?

MR. FRIEDGEN: I would say anything over 25 pounds.

MR. WRIGHT: How much do you require one man to lift?

MR. STEEL: In our production work we require men to lift 50 pounds regularly and repeatedly at high speed; that is, 100-pound bags coming off a table, with a man on each end of the table. The bags come off at 14 a minute, and those men have to handle 14 bags a minute. I defy you or anybody else to hitch up your trousers and squat down 14 times a minute.

MR. WRIGHT: Bring the bags off waist high so they won't have to squat.

MR. STEEL: We are hand-trucking these bags from the table into the car. When they get in a car the bottom bag is down at the bottom. Of course, the top bag is five or six bags up. These fellows have to pitch the bags into the car. They have to get down and get that last bag off the bottom of that truck and throw it up high against the roof of the car.

MR. WRIGHT: Why don't you bring in a conveyor to help them?

MR. STEEL: We haven't got $25,000,000 to rebuild all our plants.

MR. WRIGHT: George, how do you do it? What are your instructions at the plant?

MR. STEEL: We just let them lift it.

CHAIRMAN SCHAEFFER: Can we get instructions for proper lifting across to the fellow?

MR. BONG: We can do something but how far it will sink in is another question. You can instruct certain individuals but other individuals won't take instruction because they think they are doing it the easiest way for them. They are potential accident cases.

CHAIRMAN SCHAEFFER: In other words, they are just stubborn and they are not going to change their ways. They have been lifting bags for 20 years and they are going to keep right on doing it that way.

MR. STEEL: If they have lifted them for 20 years and there has been no back strain, I wouldn't worry too much about them.

CHAIRMAN SCHAEFFER: In instructions, is there such a thing as limiting the weight of bags or putting more men on the job and doing it just as fast?

MR. BONG: I read recently any bag over 50 pounds should have two men on it.

CHAIRMAN SCHAEFFER: Will we slow down production by doing this?

MR. BONG: You will increase it.

MR. WRIGHT: No.

CHAIRMAN SCHAEFFER: One of the things to look into is doubling up, apparently without a loss of production to start with, and then if necessary maybe we will have to slow down a little bit in order to do it. Under doubling up we have got to consider team work. We are going to have to do some work on that to find out how we are going to get our people to employ team work, so a man won't pick up a bag all alone even though he has some help.

How about the size of the load? Isn't that something we have to look into? Certain types of things have different limits than other things, don't they? You have certain objects that have different limits in weight. A large thing would have a different limit than a small thing. Are we going to say 50 pounds or 75 pounds regardless of size?

MR. WRIGHT: Don't you have standard instructions which state how much you can handle on a push truck or on a transporter? Are you going to pile them 15 high or 25 high?

CHAIRMAN SCHAEFFER: Packages are standard. Whether it is a big bag or a box or a crate, it is still standard.

We agree then that we have got to do some work on this question of limits.

Is there anything else we have got to take up immediately on this strain business? Let's leave it there and go on to our second problem—collisions. What is the first thing we are going to do on that?

MR. BONG: You have to see what physical equipment you have involved besides the man, and then what the aisleway, cornerway and traffic situation is.

MR. BONG: How about vehicle lanes?

CHAIRMAN SCHAEFFER: All right, lanes. That would include markings. How about the material or the equipment?

MR. BONG: The vehicles.

CHAIRMAN SCHAEFFER: How about another one?

MR. BOND: Lighting.

MR. STEEL: I think another one would be traffic rules, stop signs and so forth in your lanes.

CHAIRMAN SCHAEFFER: Should we use a high-sounding name like traffic engineering or something like that, or just traffic problems?

MR. BOND: Traffic regulations.

CHAIRMAN SCHAEFFER: Okay, traffic regulation.



MR. STEEL: What about the guy that just walks into a post?

MR. BONG: Vision.

CHAIRMAN SCHAEFFER: Len says vision is one of the problems there.

MR. STEEL: He can see. He is just thinking about something else.

CHAIRMAN SCHAEFFER: Carelessness. Let's look into the exams that cover this kind of thing. There again you are going into the problem of the emotional, aren't you, when you say the guy can see, that he knows where he is going, but he is not going there?

MR. STEEL: We have another problem of handling materials, I guess, that could be classed as collision. The men reaching down to pick bags up in unloading cars of bag material have no control over the floor of that car. Frequently they get splinters in their fingers. Sometimes these splinters are quite severe. What can be done about this situation?

MEMBER: Have the supplier line the car with cardboard or paper.

CHAIRMAN SCHAEFFER: This problem of surfaces is going to take a lot of work whether it is the surfaces of tables, the surfaces of trucks, the surfaces of the floors. The likelihood of skidding and having a collision—all those things come under surface, don't they?

MR. STEEL: Yes, but we can't control the surface of the floor of this car, because it isn't practical to line the car floors.

MR. BOND: How about the use of gloves in handling that material?

MR. STEEL: That is not practical in handling bags.

MEMBER: Are they paper bags?

MR. STEEL: Some of them are. Most of them are burlap bags.

MEMBER: Why do they have to touch the floor in picking up the bags?

MR. STEEL: Some of them are flat on the floor and you have to get under them to get hold of them. When you go under, your fingers sometimes come out looking like a porcupine.

MEMBER: When you speak of collision, I think of barrel goods and case goods hitting people, not of vehicular traffic.

CHAIRMAN SCHAEFFER: You are talking about stuff that gets loose and hits



people, or people sticking their hands in between two cases coming down a conveyor. That is a collision, isn't it?

MEMBER: Yes.

MR. STEEL: That is a caught between.

MR. WRIGHT: You shouldn't use collision there. I think you should call that "bumping against."

CHAIRMAN SCHAEFFER: All right, we will add the word "bumping."

MR. STEEL: And "caught between."

Any of you fellows have trouble with men running off of or slipping off of trick plates or gangways, between a dock and a car or a dock and a truck?

MR. PARKER: That would come under surfaces, wouldn't it?

MR. STEEL: How many of you have that problem?

CHAIRMAN SCHAEFFER: Can we say that is a definite problem in surfaces and call it "connections"? How about spans?

MEMBER: Ramps.

CHAIRMAN SCHAEFFER: Ramps—okay. What is another of our special problems in surfaces?

MEMBER: Ladders and scaffolds.

MR. STEEL: We are getting off the subject. We are talking about handling material. You are talking about climbing ladders now.

MR. WRIGHT: It is going to cover a lot when you handle material. It depends on whether you are up in the air or down in the cellar.

CHAIRMAN SCHAEFFER: Do you use a ladder and scaffold for handling material?

MR. WRIGHT: Sure. How do you get a pipe up? Steel pipe is material.

CHAIRMAN SCHAEFFER: Some of our plants have ladders for material handling. Maybe we are going to eliminate that when we look into it; maybe we are not.

Is there anything we want to look for under falls?

MEMBER: Tripping.

CHAIRMAN SCHAEFFER: Due to lack of instruction?

MR. PARKER: Yes. They are in a hurry.

MEMBER: Running down stairs.

CHAIRMAN SCHAEFFER: Is that a material handling problem? Aren't we going to have to look into danger spots for falls?

MEMBER: Just a minute—on that subject here, we are getting quite a ways away from the point. In our plant, when we have danger spots, we eliminate them, take steps to eliminate them.

MR. STEEL: They are still getting hurt, aren't they?

CHAIRMAN SCHAEFFER: Are we worrying about whether we eliminate or correct them, or are we now trying to discover a program which will force us and lead us to the elimination of these things? If we had never even thought of looking into these danger spots, we wouldn't eliminate them, would we?

MEMBER: If we have material to lift, we don't handle it by ladders. We get an elevator or something, some machinery, to lift it up.

CHAIRMAN SCHAEFFER: Yes. But in this conference, we discovered that in some plants ladders are used.

MEMBER: Then they are inviting the falls.

CHAIRMAN SCHAEFFER: Right.

MR. STEEL: Telephone companies and utility companies never allow anybody to climb up a ladder and carry anything. The man goes up and he lets a rope down. They use a bucket to elevate everything.

MR. WRIGHT: Do your men do it?

MR. STEEL: No. Do yours?

MR. WRIGHT: No.

CHAIRMAN SCHAEFFER: When we come to investigating this, we are admitting we are not following the best safety practices. But we are at least admitting it so we can go ahead and do something about it. We have to put it down because it does exist.

MEMBER: Everyone of those items you listed is a danger spot. Why repeat danger spots?

CHAIRMAN SCHAEFFER: Are there danger spots that cannot be eliminated?

MR. WRIGHT: Yes. If you have got a wall, how are you going to go around it?

MEMBER: Eliminate the dangers from the wall.

MR. WRIGHT: Tear it down?



CHAIRMAN SCHAEFFER: Well, there is a point. In other words, the point before the group is eliminate the word "danger spot" because you are admitting here that all these danger spots are danger spots that can't be eliminated.

MEMBER: You can eliminate all danger spots.

CHAIRMAN SCHAEFFER: Can you eliminate all danger spots. How about it, experts?

MR. STEEL: We have a lot of concrete buildings. They are not heated in the winter time, and they get terribly cold. Then along comes one of these spring winds carrying a lot of moisture. Those concrete floors get just as slick as glass. We can't put down rubber mats all over the place on those days. We have to accept a certain amount of those hazards. We have to accept that until we can eventually heat those buildings.

MEMBER: That is poor engineering.

MEMBER: I should like to have the conference consider the question of employee instruction.

MR. STEEL: Handing out a book of instructions or telling the guy once isn't instructing the man.

CHAIRMAN SCHAEFFER: Isn't the problem of how to instruct the subject of a separate conference that has to be gone through? Of course, my answer is conference. The only way we can convince men of the right way of doing things is for them to think it up themselves. The only way to get men to get together and think things economically is by the use of the conference. I don't believe any conference is worth anything if it goes over an hour. I think within an hour a man has said and absorbed all he can get.

Let's go according to that and stop at the hour. We'll throw this thing to an open discussion and see what questions you want to bring out, not only about safety but also on conference.

MR. LINDSEY C. HALE [Schenley Distillers, Frankfort, Kentucky]: You say that these conferences should not go over an hour. What should be the minimum time?

CHAIRMAN SCHAEFFER: I don't think it is worth bringing the men down from their departments for less than an hour.

MR. J. A. ROCKWELL [H. J. Heinz Company, Salem, New Jersey]: What steps would you take toward completing this conference? Do you have a follow-up and plans for committees and what not? You have only touched the surface here within one hour without cause and effect, and so on. What steps would you take to complete the conference?

CHAIRMAN SCHAEFFER: The next conference I would have in this case is a conference to plan conferences. I would not schedule the conferences for these men who have taken part in this development. They have put down here a skeleton upon which the flesh will have to be laid.

The next problem is to get together and for one hour consider nothing but how much attention should be put on these subjects and which ones should be combined. Maybe we would want to take all of the exam and history regardless of which one of the three subjects it fell under and throw those into one conference. Next, we might take lunch.

MR. WILLIAM H. RICHARDSON [General Mills, Oklahoma City, Oklahoma]: You propose that each of the hazards you have outlined be a part of these conferences?

CHAIRMAN SCHAEFFER: Yes.

MR. RICHARDSON: For the boys subject to the hazards and accidents you have outlined?

CHAIRMAN SCHAEFFER: It sounds crazy, but I think you can spend less money and get more effect by having the workers come and tell you how to avoid these accidents. They know how. They don't do it, but they know how just as well as the supervisor.

MR. RICHARDSON: In other words, you break them up into groups and let each group solve the same problem?

CHAIRMAN SCHAEFFER: I would have an hour conference with them once a month or once every two months.

MR. CLARENCE M. MACK [Corn Products Refining Company, Argo, Ill.]: How many people do you think should be the maximum number to attend a conference or take part in a conference?

CHAIRMAN SCHAEFFER: I don't think over 15 people can attend a confer-



ence. I think that is about the top. I think anything less than eight or nine is undesirable, too.

MR. STEEL: I had a very interesting experience sometime ago running conference. We were bringing our lift fork trucks into a mill. Before the men took over the trucks, I ran the Safety Council picture, *You and Your Tractor* for them. I followed this with a conference, just two men and myself and the personnel director of the plant, and let them work out their own safety rules. It has worked out beautifully for us. They did a better job than I ever could have done in writing up a set of rules.

CHAIRMAN SCHAEFFER: That is exactly what we are talking about.

MR. STEEL: I didn't have to sell them to do anything except have them typed up.

CHAIRMAN SCHAEFFER: They already knew before you had them printed because they did it themselves.

MR. R. J. O'LEARY [Corn Products Refining Company, Chicago, Ill.]: Do you attempt to reach a conclusion at the end of your conference?

CHAIRMAN SCHAEFFER: I do.

MR. O'LEARY: Do you get the causes and possible remedies?

CHAIRMAN SCHAEFFER: Yes.

MR. O'LEARY: And then do you, before the group adjourns, try to come to a common conclusion as to the best procedure to take?

CHAIRMAN SCHAEFFER: Absolutely, except in the case of conferences on free enterprise. That is the only thing that never comes to a conclusion because you can't shove that down a man's throat regardless of how many other men feel convinced. But that *is* philosophical.

But in these cases which are practical, such as safety, it is the majority that counts because the majority are usually right in these cases where they think them out and when they come to a conclusion on them.

MR. GREGG R. MEYERS [Blatz Brewing Company, Milwaukee, Wis.]: In conferences like on examination, would you suggest your doctor be there in that kind or in that particular conference; or like in hazards, the plant engineer, for the elimination of hazards?

CHAIRMAN SCHAEFFER: I believe in having experts present but not as experts. I believe that a conference door is a door of perfect equality. In other words, if the president of the company walks through that door, he is no longer the president until he gets back outside. If he is, your conference is shot. The doctor that walks inside of that conference has come there with humility. Any man who doesn't come in humility to a conference doesn't belong in it, because many times he will learn more being the expert than all the rest of the conferees together because there are so many things he never heard because nobody dared to tell him.

MR. JACK W. PERKINS [General Mills, Inc., Wichita Falls, Texas]: How do you make your conference a matter of permanent record? Do you use merely the outline as you have developed it there or do you develop each one of the topics for a matter of record?

CHAIRMAN SCHAEFFER: We use our outlines and we also write little case histories where we think it is necessary in order to explain problems. This is not for the purpose of giving these histories out, but for the purpose of the conference leader who has to more or less be the continuity man in the thing. For instance, in the case of conferences we are carrying on right now on discipline, one of our foremen will call us right in the midst of developing it and say, "What was that point that we had so brought out? I can't remember. What was his argument?" Well, I like to put those things down, so I can remember them.

Besides that, you should keep all your outlines in form and in sequence and in a booklet so you have them available. And every individual who attends should receive a separate copy of each outline within a few days after it was produced. When your complete conference is finished, give them a complete booklet of all the conference material with the conclusions developed at the front.

MR. ELMER G. HUTZLEY [Campbell Soup Company, Camden, N. J.]: Your idea in conference is to take the men who are running the fork trucks and have them as a group have a conference and lick their particular problems? Should their foremen be in on that?

CHAIRMAN SCHAEFFER: That is right, 100 per cent.



MR. HUTZLEY: If you have a general foreman over the whole group, plus the subforemen or the junior foremen, they should definitely be there to follow through on the questions that might come up.

CHAIRMAN SCHAEFFER: That is right.

MR. STEEL: I disagree on that. I don't believe men are going to open up and let their hair down if the boss is in the room.

CHAIRMAN SCHAEFFER: I don't believe that it is worthwhile having conferences unless you attain the objective of a conference, which is equality for the purpose of production.

The conference should get every man interested in the problem of production, because safety is part of production. If the workers cannot learn to speak about production freely in front of the men who have to carry that out, you have lost your objective in conference.

I think you will always find, if you will hold a conference on how to conduct a conference, that all men will agree that there should be no personalities. It should not be a case of: "Well, Joe, you do it this way, and I think that is wrong." It is a matter of: "Well, we do it this way and it is wrong, I think. I think maybe we ought to do it this way." Not: "I do it this way and that is why it is right."

It may take six months, sometimes a year, but it is possible to get the most average worker to open up and talk (even about human relations and that is a tough subject) in front of the vice-president in charge of production! I think that you have lost that objective, if you don't go toward that goal. Unless the men at the top hear the criticism from the man at the level of the machine, it isn't going to take. They have to hear it at some time or another from the man who really said it, and then it begins to take.

I have seen it work where a vice-president, after three or four visits, has actually come to the point where he says, "After all, this is only my opinion," instead of, "Well, I don't approve of that. That isn't the right thing." It isn't a matter of whether he thinks it is the right thing. It is a matter of whether the majority thinks it is the right thing. That is what a conference is.

If you get these men started talking about these impersonal things, such as about how to save a life, impersonal in that nobody's personality is hurt, you can get them started on a lot of other things in safety, such as attitude and so on.

MR. A. R. SHEPHERD [National Association of Refrigerated Warehouses, Chicago, Ill.]: How do you get that message across where there is a heavy labor turnover?

CHAIRMAN SCHAEFFER: Some day I hope I will be able to have a conference with all the people who come into the plant on safety and induction. Then, instead of telling them, I will ask them how they would like to be inducted and go ahead and do it that way. I would ask them what they think they ought to do about safety in the plant, and let them tell you. They will tell you. Maybe we haven't listened to them enough.

But I have some day to have the chance of taking 10 people or 15 people that are hired and give them a chance to tell me. I want to have a chance to tell them: "What are you going to do about keeping safety in the plant? Tell me what we can do for you."

MR. SHEPHERD: If you shifted these men around from one department to another, wouldn't you have to cover the whole field in doing that?

MR. STEEL: In the type of program you are talking about, would it be practical to take the new men who haven't worked in the plant and ask them what the hazards are? Should they not work a week or two first?

CHAIRMAN SCHAEFFER: I thoroughly agree with you, but, on the other hand, they will actually see things in the first two days that the fellow who has been there months and years overlooks. It is an old picture to those who have been there months and years. They get used to the dangerous spots. They don't look dangerous to them any more.

MR. HUTZLEY: I think Mr. Shepherd's point on labor turnover is certainly something to think about because that is a big problem. I know it is in our place.

MR. LEROY COLLINS [Spencer Kellogg & Sons, Buffalo, N. Y.]: You spoke of having your president or vice-president attend conferences. Can you tell me how we



CHAIRMAN SCHAEFFER: That is a tough one, all right. It took a year of this technique to get the first top executive into a conference at Kraft Cheese. The technique was this: I wrote a special invitation to all top executives two weeks before the conference. The day before the conference they got it again. They got an invitation to every conference that was held. Their secretary had a list of all the conferences. They could go to the secretary and say, "What conferences are going on today?" It took a year before the first man showed up. At the end of three years we had five top executives that had attended at some time or another. Much more important than that, after they got there they learned the rules.

Another point is very embarrassing unless you handle it right; that is, orienting the executive to the conference. You must remember that these executives are our bosses and, regardless of what the majority thinks, if the policy is still so and so, we are still going to have to live with that policy, until it is changed. The only way it will be changed is for the top executive who makes the policy to learn the objections from the common man. The boss won't change it just because you go to him and tell him the people don't want it that way. But when the people themselves talk in front of him and say, "This is the way it ought to be," it begins to soak in. Of course, that takes years.

MR. MACK: On the same subject of different levels of participants in these conferences, you have the vice-president in. These people on the firing line at this conference will agree to all these things we have talked about. But, as George said, it is going to cost $40,000 to $50,000 to really lick this problem. They will agree to all these things. But when they leave that conference, back in their heads they are going to say they don't want to spend that money to do these things for us.

Aren't you defeating the purpose of conference if the vice-president does nothing

[illegible] most people become a part of management on a conference basis, they also become management's thinking or they are no use; that is, they become cost conscious.

MR. JOHN GROFF [American Maize-Products Company, Roby, Ind.]: In the last several years we have had several conferences. We tried to override our vice-president, who is always the conference leader.

CHAIRMAN SCHAEFFER: Then it is not a conference.

MR. GROFF: Several different fellows tried to break him down. They couldn't do it.

I also go along with George. He says if you have foremen present at the meeting they are going to keep quiet. But as soon as he goes, they open up. If he hangs around for the whole meeting, they keep quiet. But if the vice-president or superintendent is there, they will really talk.

CHAIRMAN SCHAEFFER: You haven't got any conference in your plant. There is no use kidding yourself about it. If you haven't got a conference, don't waste your money.

I will admit all the conferences I have been leading in my life haven't been real conferences. However, I have led conferences where the men on the second level have eventually, after a year or so, come to the point of accepting the conference method.

We just had a case of it in our own plant. We tried for two years with this man. The man finally retired and somebody else took his job. Then the new man came in and said, "Look, boys, I am on your level. Whatever I say is only my own opinion while I am here. Of course, I make the rules while I am outside. But if you can convince me I am making the wrong rules on the outside, maybe I can and will do something about it. I want to get your point of view here. It might help. But while I am here, it is just my opinion."

That is a conference.

MR. COLLINS: I would like to have questions. You are going to start over again. When are you ever going to get to so-called Utopia?

CHAIRMAN SCHAEFFER: That is the wonderful thing about life. Utopia is just around the corner. If it would work, it wouldn't be. That is one of the facts of life.

But I do think you have the same problems regardless of personnel and regardless of whether you have a change of personnel or not, you will still have to go over the same problems as far as the top executives are concerned. The battering at the walls [illegible] executive way, because when the wall is finally broken down you actually have an answer. It isn't your answer; it is the people that know that are giving the answer.

The definition of a conference, as far as I am concerned, is this: A conference is a meeting in which the people who are normally the audience are the speakers.

MR. STEEL: I look upon a conference as a pooling of experiences and knowledge to arrive at a conclusion to solve a problem.

CHAIRMAN SCHAEFFER: That is a much better definition because it really includes the objective.



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# Can Safety Attitudes Be Changed?

By WALTER W. WOOD
Personnel Director, Kimball Glass Division, Owens-Illinois Glass Co., Vineland, N. J.

In our town there was a conscientious barber who promised at a revival meeting that he would speak to some sinner about his soul before next Sunday. The evangelist had asked the congregation for a show of hands, pledging every person so volunteering to speak to another individual within the week about his soul's salvation. And the barber made his promise.

Like most barbers, he had no difficulty making conversation while he worked on his customers; but asking a man about the salvation of his soul was a different proposition. Since he knew he would have many customers during the week, it was not necessary for him to be in any hurry. Monday passed and he had not kept his promise. Everytime he thought of approaching someone on that subject, he took a cold chill. Tuesday passed, Wednesday, Thursday and Friday—all went by and still he had not screwed up courage enough to ask one of his customers about his soul's salvation.

Finally Saturday night had come and the last customer was in his barber chair. This was his final opportunity to fulfil his promise. The more he thought about it, the more he quaked and trembled. He turned pale. His mouth became dry. He had difficulty strapping his razor. He leaned over his customer, trembling. He swallowed hard and, with the razor poised in his shaking hand, he said in a graveyard voice which he himself did not recognize, "My friend, are you prepared to die?"

The frightened customer jumped out of the barber chair, flung off the white apron, and shouted as he disappeared through the door, "Hell no, I'm not!"

The poor, well-meaning barber had approached him with a very inappropriate question for that particular time and setting.

How is your approach to people? What results do you get? Check over your approach to people and if results have not been good—junk it and get a new approach.

You and I are determined to reduce accidents, or we would not be here. We are hungry for ideas that will help do the job.

This great safety congress and the broad extent of the program being presented make us realize the tremendous job before us. Let's consider two aspects of this problem. First, the safety director's approach to people—the human relation angle and how to win friends and influence people for safety. This point is often overlooked in its importance. Second, the safety director's approach to promotion material—stimulating interest through contests and stunts.

What about a safety director's approach to people? What do the people think when he approaches? What do the foremen think about when he comes into their department?

The foreman might think of things like these:

"Here comes old mercy again. Wonder what he will find today to gripe about."

"Wonder what new safety guard he has cooked up this time."

"I suppose he'll complain of our good housekeeping."

"Hope he does not want me to go on inspection with him."

"Wonder if he has another silly promotion stunt for us."

It is very possible that a foreman feels that it is the safety director's and personnel department's job to think up new stunts to keep his workers interested.

Because the safety department is very energetic in conducting safety contests, safety suggestion programs, publishing of safety regulations and distributing of safety posters, foremen may take the attitude that the safety program is something extra—something on the side, handled by a special department—just extra "frosting on the cake."

Or does the foreman think like this:

"Boy, I'm glad to see you. Thought you had forgotten us."

"Anything new to help us with our safety record? Believe we could use a new stimulating safety stunt."

"We have all the safety suggestions installed and all the dirty spots cleaned up as you recommended on your last inspection."



"Wish you would get around more often, we like it."

Certainly we need to create team-play between supervision and the safety director.

If we reduce human errors in handling people, will it help improve our accident programs? Will it help "safety morale" within a plant to be on the upgrade?

Will reducing human errors create for the safety director better department prestige, plant prestige? Will it help the safety man get things done because he is a great guy, fair and honest?

We know that the spoken word is soon forgotten, so for memory's sake, let's use Tommy Armour's, a great teacher of golf, three rules of advice:

(1) Keep your eye on the ball.
(2) Pause at the top of your backswing.
(3) Follow through with your club head.

It sounds simple, doesn't it? But if you are a golfer, you know how hard it is to observe even one of these rules, consistently—let alone all three of them.

The value of Tommy Armour's approach to the game of golf is that it cuts through the hundred and one minor, petty faults, and comes directly to the three major, essential principles. It takes into consideration that three different things are about all the average person can concentrate on at one time.

There are almost as many different theories of golf as there are professionals teaching it. You've heard them all. Keep the left arm straight—cock your wrists—swing your hips—keep your head down—keep your shoulders up—don't kill the ball—and many more. All good advice, but they are details incidental to the main issues of keeping your eye on the ball, pausing at the top of your backswing and following through with your club head.

It will be interesting to take these three rules of golf and see how they apply to people. How these rules might help us remember that a safety director's approach to people is one of the most important tasks in his job of preventing accidents.

Keeping your eye on the *ball*, of course, simply means keeping your eye on the main objective. It may be protective equipment. It may be safety promotions and contests. It may be inspections. It may be a better way of doing your particular job. It may be human engineering.

How many errors do you and I make a day in handling people? Who knows?

Does the boss know?

Do your people know?

We do not have any measuring stick to tell us. In baseball, if the second baseman muffs a fly ball, it goes down in the score book as an error. If he is weak on fly balls, hours of practice are put in to correct this fault. Human relation errors can be corrected, too, by practice. Let's compare a few of these errors in baseball.

(1) A wild throw—might be like angry, high voices—bawling someone out before others. It is an error.
(2) Striking at a bad ball—might be like a brush off of the employee who is asking for or help. The B.O. treatment—see me some other time, I am too busy now. Another error.
(3) Overrunning a fly ball—is like underestimating a gripe or complaint as a symptom of trouble.
(4) Arguing with the ump, getting kicked out of the ballgame—is like saying the wrong thing, or failure to get all the facts surrounding an accident.

These and many others are glaring errors. How can we overcome these errors? By practicing the art of smart relationship with others, and we do mean practicing.

We are all like turtles—not much good until we get our necks out.

What sort of philosophy of life do you have to fall back on in solving problems that confront you? Is it the golden rule?

What system do you use in getting along with people? Or do you stumble along without a pattern of behavior? There are many good ways, just as there are the many different theories of golf.

For our discussion, the first important objective is "The Approach to People."

The safety man must make approaches to many groups of people. In a lost-time accid: . he must approach these five groups:

(1) The person who has been injured.
(2) The supervisor concerned.
(3) The foreman in charge.
(4) The injured person's family.
(5) The doctor and the nurse in attendance.

The approach to each one of these groups is important. We, in safety, want an approach that will give us efficient service and help us build prestige and traditional no-accident history.

Safety, you know, is like milking a cow. A man has his hands full.

The greatest extra effort for safety lies *in our ability* to get cooperation from people.

Let us use the game of football to illustrate this first objective, "The Approach."

Let's assume we are coaching. We have as one of our candidates a large 220 pound youngster, agile, but a little slow of foot, so we decide to make him a tackle. We proceed to teach him the fundamentals, the proper offensive stance, blocks, etc. We start, let's say, with the shoulder block. So we *try to* impress on our prospect how important it is to make body contact with the opponent; how he must get under or get past those defensive hands that are ready to smack him down.

Contact is important to him just as it is to us in safety work. People have their hands out too, keeping us away. We must get by them to make contact—to make a good approach. The tackle must be taught ways to get by the defensive hands ready to knock him out of the way. He must be taught the head duck, the shoulder dip, the fast charge, the feint charge, etc. He must practice all these approaches to the problem until they are committed to his nervous system so he does not have to think about each one, but rather they become automatic reactions as part of his play. The harder he practices, the greater his performance, the more perfect his approach. And it is so with us, the more thinking of our approach to people, the better our results.

It is not from *lack* of *knowledge* that we fail but from lack of application—which is really a lack of proper approach in human relations.

It is so easy to take this attitude:

Our safety record would be better, *but* our people are indifferent.

Our good housekeeping scores would be higher, *but management gives only lip* service.

Our protective equipment would be worn more, *but* our people can't be sold. *It's* too heavy, too hot or too inconvenient.

Our costs would be lower, *but* the people are careless and waste too much.

Our service would be tops, *but* we put things off until tomorrow.

Our people's program would be warmer, *but* production pushes it into the background.

*But* a little more effort, *but* a little more interest, *but* a little more understanding will give us a better way. We have a choice. Shall we be *just* average or shall we be tops? Nothing but people can put us there. It is worth all the effort we can muster together to win our first objective—"*A warm approach to people.*" So keep your eye on the ball.

Remember too that we will get kicked around in rendering this service to people, just as Jesus did. You will recall the story of the ten lepers who came to Jesus for cleansing and only one in ten knelt down and gave thanks. Well the ratio is not any better today—one in ten will give thanks or be considerate.

Getting kicked around should not dampen our enthusiasm.

The second rule is "Pause at the top of the backswing." This is another way of saying, "Look before you leap."

Take into account all the possible consequences of your act before you make it. Marshal all your poise and balance. Take careful aim before you fire. Do some thinking. If I should flip a coin with one of you for a dinner, it would not make much difference if it came down heads or tails as our company would probably pay the bill anyway. But you and I can't make decisions on a heads or tails basis.

We must put ourselves in the other fellow's shoes. Try to get his point of view. It is very *important* what *he* thinks. If occasion arises we must give chance to save face.

Suppose he suggests a safe way to do a job and you don't like his idea, so you say, "You are all wet, you are dead wrong with your thinking." He does not have a chance. You could better say, "That sounds pretty good but have you thought of it like this?" So you give him a chance to save face and to accept your idea and still feel a part of the team. Remember then to "Pause at the top of your backswing." Do some thinking.

Rule number three—"Follow through with your club head." Once you have made up your mind, once the club head has started down, it's too late to turn back. Put everything you have into it. Carry it through



to the grandest conclusion of which you are capable. Remembering that what you say and how you say it, will help get the results desired.

All three of these rules tied together are dependent on this follow through.

The kind of approach we make with our people depends on what we say and how we say it.

Putting ourselves in the other fellow's shoes, depends on what we say and how we say it.

Saving face depends on what we say and how we say it.

Words are dynamite; words are as colorful as a red rose. It is our job to put them together in an attempt to get cooperation from people.

It means personal responsibility. It means personal supervision. It makes it necessary for each safety director, each supervisor, to personally "Follow through." An old negro friend of mine put it this way, "When I prays for de Lawd to send me a turkey, nuffin happens. But when I prays for de Lawd to send me after a turkey, den de Lawd gets results."

Our second point for discussion will be a safety director's approach to promotion material—stimulating interest through contests and stunts. For this purpose I will describe safety contest now being used at the Vineland Plant of Kimble Glass. This is one illustration of a scheme for promoting safety.

### Purpose

Primarily the purpose of the "Beat Par" safety contest was to change the attitude of the people toward the problem of safety and to give each individual a stake in working safely. The secondary purpose was to reduce the number of lost-time injuries.

During 1947, there had been too many lost-time accidents. Sixty-two per cent of all lost-time accidents were of less than four days duration, indicating that perhaps the so-called lost-time cases were more of an absenteeism problem than they were a physical disability.

The "Beat Par" contest was directed at reducing these short-term cases by giving employees a reason to remain on the job, if they were physically able, rather than take a few days off to "recuperate." (The plant or family physician determines if the employee is physically able to stay on the job).

### Plan

With these two ideas in mind—(1) changing employees' attitude and (2) reducing the number of lost-time injuries, especially the short-term cases—a "Beat Par" safety contest was developed.

We know that the ideal par figure would be zero for each division of the plant but we also know from past experience that the ideal cannot be reached in one fell swoop. Accordingly, we made a statistical study of each division for the previous five years to determine what the average for each quarter for each division had been.

After finding what the average had been for each of the preceding five years by quarters, we then cut that average by 50 per cent and established those figures as par for each division. In short, we set a figure as the "allowable number of lost-time injuries" for eligibility for the contest.

After setting up the "par" figures, it was immediately seen that there would have to be two prizes since one division had been given "par" figures of zero for two quarters. So a grand prize and a second prize were decided on for each quarter's contest.

The grand prize was to be a weekend trip to New York for some lucky employee and his wife or a friend. The second prize was a table model radio.

Each prize was awarded quarterly by drawing from the names of all eligible employees. To be eligible for the grand prize drawing the employees' division must have had less lost-time accidents than the "par" figure set for his division for the quarter. Furthermore, he must not have suffered a long-time injury himself.

Eligibility for the second prize drawing included all people eligible for the grand prize plus all people in divisions which equalled the "par" figure for the quarter. Anyone having a lost-time injury was also disqualified from eligibility for this drawing.

Following establishment of the awards and eligibility for the drawings, the next step was to start promotion of the contest. A teaser campaign was launched through the use of books of tickets which were given to each employee and the use of bulletin board teaser posters. The books of tickets were of a size comparable to meal ticket books used in the plant cafeteria and contained tickets for a broadway stage show, a sports event (pro football or basket-

ball), room in one of the better hotels, *train tickets, meal expenses, etc.*

A few days after the teaser campaign had been launched through the medium of the books of tickets, a letter was given to each employee from the plant manager explaining the contest, awards, rules of eligibility, etc.

At the same time, the bulletin board promotional material switched from the teaser campaign to a theme of explanation of the contest and the value of the contest to the individual employee. The employees' *monthly magazine* was also brought into the scheme by using it as a means of promoting the plan.

Sustained interest was maintained throughout each quarter through every available *means—bulletin boards, magazine, letters,* posters, special signs, etc. Just prior to the start of each new quarterly contest a special promotional scheme was created and given to each individual employee to remind *him not to let down* because a *new contest* was due to start soon.

Meanwhile, a word-of-mouth promotional idea was started and maintained by supervisors and key workers.

### Results

While the results of the program are not complete for the year, it is interesting to study the first nine months of 1948 as compared to the *first nine months of 1947.* In 1947, there had been 71 lost-time injuries through September while in 1948, during the same period, there were 19 lost-time injuries. This means that lost-time injuries have been *reduced by 73 per cent over 1947.*

Of the total number of lost-time injuries for 1948, about 50 per cent of the cases were of seven days or less which is a drop of about 12 per cent in short-term injuries. *More important than the* decrease of short-term injuries is the change in attitude of the employees which has been noted by the *plant medical service and the supervisors.*

The plant medical service reports a noticeable change in the attitude of people treated for injuries. The old feeling of "Well, guess I'll take the rest of the week off to let my cut finger heal" has been replaced by the feeling of "Say, this won't *cause me to lose any time, will it?*"

Whether this change in attitude on the part of employees can be attributed to the "Beat par" safety contest is hard to say, but plant management is inclined to give a great share of the credit to the contest along with the change of attitude of supervision toward the problem of safety.

Prof. Elton Mayo of Harvard University Business School, Division of Research, in his book on "The Social Problems of an Industrial Civilization" makes this startling statement: *"If our social skills* had kept step with our technical skills we would not have had World War II."

By social skill he means our ability to secure cooperation between people.

So the *greatest* extra stretch for safety lies in our ability to get cooperation from people.

We must be conscious of people's desires and what makes them tick.

Will you use this or a like philosophy as handles to help with your problems?—*Here it is* again:

*First*—Keep your eye on the ball.
Means approach—a good, warm approach. The approach is important.

*Second*—*Pause* at the top of your backswing. Means to put yourself in the other fellow's shoes. Let him save face. Think—think—get *his point* of view.

*Third*—Follow through.
Means—"What you *say* and how you say it." It will make the *sale.*

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# Heat and Radiation in Glass and Ceramic Trades

**(A Summary of a Talk)**

**By KARL DUNN**
**Industrial Hygienist, Corning Glass Works, Corning, N. Y.**

Karl Dunn, industrial hygienist, discussed the problem of heat radiation and the ways in which workers react to it.

Mr. Dunn showed the effects of various temperatures on workers and told what can be done and what is being done to solve the problem and improve working conditions.



Of all the heat lost through a furnace, radiant heat is by far the most important. The source is the infra-red rays, non-visible to the eye and non-heat producers in themselves, generating heat only when they strike an object.

To illustrate the rapid increase of radiant heat as the temperature of the furnace is increased, Mr. Dunn showed that when a furnace operating at 1000 degrees is raised to 1100 degrees, the temperature increased 10 per cent and radiation jumps 47 per cent. A furnace operating at 2000 degrees brings the temperature up 100 per cent and the radiation to 1500 per cent.

Such an increase in radiation upsets the human heat balance and a man working close to the furnace is taking on more heat through radiation than he can lose through convection and evaporation.

There is no adequate way to measure temperature, radiation and air movement. Thermometers now in existence merely measure the expansion of mercury, said Mr. Dunn illustrated this point by citing the case of three metal containers; one covered with foil, one painted black and one ordinary metal can and all subjected to the rays of a heat lamp. Thermometers placed in the three cans register three different temperatures, proving that thermometers react only to surroundings, and nothing else. Mr. Dunn pointed out that man's reaction is similar to that of the black container. Infra-red rays pass through the can, as through a man's body, and force the temperature up. The one wrapped in tin foil, of course, had the lowest temperature, since the foil screens out the heat producing rays.

Man picks up radiated heat irrespective of color of skin.

To show the effects of radiant heat on the worker, Mr. Dunn told of putting a replica of the Corning Glass Works trademark (glass blower) through a series of heat tests, while his temperature changes were recorded on a clinical thermometer.

The "little man," with a temperature recording device strapped around his waist, was subjected to radiation from a tiny glass furnace. Almost immediately the infra-red rays increased the man's temperature to 105 degrees. A heat absorbing glass, which would remove the infra-red rays, was inserted between the man and the furnace, and the man's temperature returned to normal.

Next an infra-red transmitting black glass was placed between the man and the radiant source, but the black glass did not screen out the infra-red rays and the man's temperature began to rise again.

As a further experiment, fans were connected and placed directly on the man, but served only to increase his discomfort as his temperature continued to rise because of the heating of the fan's blast by the furnace heat.

To demonstrate the *pressure* of rays of light, Mr. Dunn noted that when he placed a radiometer in the rays of a heat lamp, the vanes were shortly spinning rapidly. The vanes were black on one side (heat absorbing) and plain on the other (heat reflecting), suggesting that some type of reflective clothing might be developed to offset heat radiation's effect on the worker.

What can be done, then, to shield the man from the radiant source and not impair his efficiency?

Heat suits have been used in emergencies, but they are cumbersome and for a worker who has to be other than stationary at his job they are not practical.

A screen of aluminum foil between the worker and the radiant source will filter out the infra-red rays and maintain the worker's temperature near normal. However, with such a screen between him and his job, the man is unable to visually follow his work.

Mr. Dunn demonstrated also the effectiveness of a blackened copper screen when placed between the man and the furnace. The man's temperature in this instance remained near normal, and in addition he had the advantage of being able to see his job.

With the use of such screens as aluminum foil and black copper mesh, a hood would be constructed at the top of the furnace, with blowers to shoot the heat up toward the roof.

Right at the moment experimentation is going forward on various types of fabrics, in an effort to discover one that may have the necessary qualities to offset or screen out heat radiation.



# Dust Control in a New Type Glass Batch House and Its Application to Potteries

By A. S. MILNER
General Manager, Milner Engineering Company, Muncie, Ind.

The "batch system" is a method for the storing, mixing and handling of the batch from the time it gets in your plant in a car until it gets into the furnace. This phase of the operation produces the dust in a glass plant and gives rise to opportunities for silicosis, etc.

To begin with, we have a box car coming down into the plant and we attempt to unload it in a modern method. We have a power shovel operated by a man. He gets into a box car loaded with soda ash. This is probably the most disagreeable job known in the glass industry. But unfortunately that is the best thing we have developed. However we do have the power shovel. At a timed interval, it will wind up and scoop the material out.

There have been some recent developments in a new type of power shovel that operates without any manual effort. It is operated from outside the car by a man with a push button. It is being tested in two or three plants, but there are a lot of "bugs" in it that haven't been worked out so, of course, we couldn't put it in our plants. When it is finished, it will be something you people should be very much interested in securing. As I say, it has a lot of "bugs" in it, and it requires a great amount of repairing. Until such time as it is developed, we suggest you stay away from it.

We have to get the material into some storage container as you might call it. We use a single silo unit which is divided into compartments. There is a large compartment for sand and various small compartments for the other ingredients—soda ash and feldspar and lime, depending on the formula.

We have tried to eliminate, as far as possible, any climbing connected with this job. In a lot of the old batch plants, you will find some devices similar to this in which a man has to get up on top to shift the conveying mechanism about to get the proper material into the proper compartment. Most plants have multiple silos and a man must get up and adjust the equipment to get the sand where it belongs and the soda ash where it belongs, etc.

We have developed a remote control system. The material goes up in a bucket elevator to the conveyor which, in turn, charges on to a rotating affair and is controlled by a push button from the ground level. If you get a car of soda ash in, the operator presses the soda ash button and the conveyor revolves around to the soda ash compartment, and you can unload the car. If the next car up is a car of lime, he simply presses the lime button and the conveyor revolves around to the lime compartment.

When we have all the materials in the silo, we must then weigh them out in the quantities desired. For that purpose we have vibrating feeders that feed out from the various compartments like spouts in a well and terminate in two weigh-hoppers. We built a light-gauge steel hood over these two scales. It is round like a turret. The feeders project through holes into that hood and we have rubber gaskets to seal them off.

This is a place where, in most of your plants, you get dust. Naturally, any time you move a material that is of fine particles, you are going to get dust. So, in each case where we have run into that hazard, we try to do something about it. In order to reduce the dust in feeding our scales we run a duct system to our main dust collector. Thus we have a negative pressure in this hood at all times. Whenever you feed material in there, the air that is displaced goes to this dust collector. So when we weigh the material, we have to discharge it from the scales after we have accumulated a batch by push button. Again these scales discharge on to a collector belt into our mixer. Again we have a dust hazard. So we seal this off with canvas seals on to the bottom of this weigh-hopper so that all the dust will be contained in this unit. This conveyor is a belt conveyer that is enclosed in a dust-tight housing so we create then, again, a negative pressure inside this housing so that when these scales discharge, any dust that is in the air will be collected.



So this goes on in a series. Each time we run into where we might have dust, we try to do something about it. When we discharge into the mixer we create a negative pressure in the system and collect the air we have displaced when the mixer is discharged again at another point. We have a series of pipes running all over this plant, piping into whatever hazard exists. Wherever you use a naturally light material, you are going to create dust, so we have piped to these various places.

At the point where we discharge into bins, there is a tremendous amount of dust. We try to disperse that dust. It isn't essential, we believe, to collect it. That is one step further you might go. It might be desirable, but it is expensive. We feel that in most cases it is just as well to disperse that dust into the atmosphere. This silo is 93 feet high so we have fans that are connected to these conveyors. Any time those conveyors are running, these fans are running so when the dust occurs up here at the various discharge points, these fans blow it into the atmosphere at 93 feet from the ground and it is dispersed over quite a wide area and won't bother anyone.

The batch plants were not built particularly to get safety. We built them to eliminate labor and to make labor more efficient so what we try to do is to build these plants as far as possible to be operated automatically. We built three or four types of these. One is operated with a push button panel. We have another system which is completely automatically controlled by a furnace. When the furnace needs a batch, it automatically goes there.

To unload cars safely, we use a key system in order to prevent the operator from getting the wrong material in the wrong bin. If he has a car of lime coming in, he has to get the foreman to hand him the lime key. That key will only operate in this keyhole so that we have the lime switch. He presses the key in the lime keyhole which allows him to turn the switch. It can't operate any other one. The foreman controls that. We don't want to ever get a carload of lime on several carloads of soda ash. That has been done many times. There is an interlocking system to prevent that. By throwing the switch, all conveyors are automatically started. It moves the conveyors around to the proper location and starts all the machinery and the fan, etc. so the car is unloaded. When it is unloaded, he throws the switch back. That prevents any running up and down of the silo which might cause a man to fall off. Of course, it is necessary to go up there occasionally for maintenance, in which case we provide a little elevator.

The operator sits at the control panel and watches the scale. When he wants five hundred pounds of sand, he presses the button. When he gets five hundred pounds on the dial, he quits. That is all it amounts to. It operates the vibrating feeders that feed the weigh-hoppers, and he accumulates this batch by simply pressing the buttons.

The scales in a remote control plant are operated by photoelectric cells. This represents the various supply bins. This will be the sand bin, the soda ash bin, the feldspar bin, etc. These various bins go through the feeders into the scales to the belt conveyor to the bucket elevator to the mixer and on into the supply bins of the mixed batch. Then we have small belt conveyors running right to the furnace.

When the furnace needs a batch, these belt conveyors operate which, of course, drains the bins. When it gets to a certain level, it indicates that more batch is required. Automatically, the first feeder starts feeding. Automatically, it is cut off at the desired weight. The batch is accumulated, weighed, mixed and delivered right into the furnace. That is a remote control plant where you use no labor whatever. Nobody is near that except a good electrician when things start going wrong.

I did not stress safety in my remarks because that is not our primary concern. I do want to say that at the completion of one of our plants last year, we had one of the insurance companies send in a representative to check the dust at all points to see what results we had been able to get. The report came to us that there was less dust in our batch plant than there is on the corner of Meridian and Washington Streets in Indianapolis.

### Discussion

MR. THOMAS [Libbey Glass Company, Shreveport, Louisiana]: What is the capacity of each section of your raw material bin?

MR. MILNER: The total capacity of the entire plant is 2,951 tons of live storage

which is about sixty- carloads. Now we divide that in any number of ways. It can be divided into eight compartments, ten compartments or twelve compartments, depending on your own desires. We never get less than a two-car capacity in one bin but it can go up to three cars. However the total capacity is sixty carloads, divided any way you want.

MR. WYATT (Owens-Illinois Glass Company): What has been your experience with handling material coming in in hopper-bottom cars?

MR. MILNER: More and more hopper cars are becoming available. Our plant is designed to take care of hopper-bottom cars. If you can get hopper-bottom cars, that is ideal. Some say that fifty per cent of the materials are now coming in in hopper-bottom cars. Eventually, we will have it one hundred per cent.

MR. WYATT: You have to have another man to open your hopper-bottom. Maybe one man could do it.

MR. MILNER: That is right. The man shifts the car where he wants it. He goes out and opens the hopper-bottom and then closes it and brings the next car down. It is still a one-man operation. It, of course, eliminates the man getting into the car which is hazardous operation. There doesn't seem to be much anybody can do about it at the moment. I have seen engineers work out a complete dust control system where the car goes inside of a big dust collector, but this system has never been perfected. I think possibly in a couple of years, you will have one hundred per cent hopper-bottom cars.

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## Vision in Safety

By MILTON M. BOWMAN

Supervisor of Accident Prevention, Cleveland Transit Company, Cleveland, Ohio

About eight miles from here, 64 years ago this month, a young girl was curling her hair with an old-fashioned curling iron and her sister, in a moment of play, brushed against her elbow and the curling iron went into her eye causing the retina to be detached. You professional people know what occurred—blindness in that eye immediately. A year before this lady passed on she was blind in the other eye.

In 1918 when I was in World War I a railroad yardmaster was bringing an engine around a clear track to the roundhouse because the crew had worked their 16 hours and had gotten off. This yardmaster was bringing a light engine back through a clear track to take it to the roundhouse and all of a sudden, he heard some screams. The yardmaster cut the power and brought the engine to a stop as quickly as possible. He found that he had not seen a push-car being pushed by several Mexican track workers. Fortunately for all, no one was killed. But it brought to that man's mind the fact that there was something wrong with his vision for, after traveling that track for years and years, how was it that he had not seen these men?

He immediately pulled himself off the job and went to a doctor and discovered that he had a senile cataract developing which prevented him from seeing that push-car. After a successful operation, his vision returned to him. He was seeing 20/20 plus, when I came back from France. He carried on with his work for 10 years and was promoted.

The lady I spoke about was my mother, and the man, my dad. I dedicated my work to them. She lost her vision completely. His defective vision might have cost the life of one of his fellow men.

Let's see what vision the employes have. Let's place them on jobs where they can work efficiently and safely. We are doing that. We are screening our new employes. We are studying the men who have accidents and the men who do not have accidents, and the characteristics of these men—particularly in vision, which is a very important part of the work. We have been working on it for two years under the direction of the accident prevention department in cooperation with the medical department. We have a young industrial psychologist who heads that work.



I proved to myself many years ago that the more you tell an industrial worker about his eyes, even if you have to stand on your head or hang from a chandelier to do it, the more he will want to protect them. But if he will not wear a well-fitted pair of goggles or safety glasses, his case should be investigated because the correction that exists plays a very important part.

Don't overlook correction, by all means.

First, you must consider your eyes a very important part of your body. Don't experiment with them. Second, if you do have difficulty seek competent professional talent. Third, follow the advice given you. If it's glasses you need, get the best. If it's bad teeth, bad tonsils, diabetes, a constitutional defect or what-have-you, let's do something about it.

I want to say that, after 30 years of experimenting, studying and working under ophthalmologists and professional optometrists, I have learned there are many, many ways that you can lose your vision. Science and medicine will never be able to catch up. Doctors cannot restore sight that has once been lost to you. Take care of your eyes and they will take care of you.

Safety directors should know about astigmatism, hyperopia, myopia, glaucoma and all of those $50 words, but let's get it down to facts where you and I can get on the assembly line and give it to them quickly and in terms they can remember.

What I want to do is to get these technicalities to you so that you can hang on to them and deliver them to the men who are having accidents.

To illustrate this I would like to have Mr. Gregory and Mr. McCormick stand up.

Mr. Gregory take your glasses off. Take a look at Mr. McCormick. You can't see Mr. McCormick very well.

MR. GREGORY: Hardly at all.

MR. McCORMICK: I see something green. That is all.

MR. BOWMAN: Both of them admit that they have an eye defect. So we will call them "E.D."—Eye Defect.

Mr. Gregory take your thumb and your index finger and make a small hole and look at Mr. McCormick. You can see him. Mr. McCormick, you do it and look at Mr. Gregory. You can see him.

Both of them said they couldn't see one another. Still, they looked through a little hole and saw one another.

I want to show you how easy it is for Mr. Gregory to tell he has near-sighted glasses. Take them in your hands, Don, and hold them four inches from your eyes. Move them sideways. Everything moves with the motion of the glasses. That means near-sightedness.

Mr. McCormick, turn your glasses around. You have astigmatism in one eye, haven't you?

Don, take Mr. McCormick's glasses and look at them and rotate them. If you were looking at a flag pole, it would wave like that. That means astigmatism.

Take your glasses off a minute, Don. I know you can read. I want you to take this *Readers' Digest* and hold it close to your nose and read it for me. (Mr. Gregory reads a little.) You are doing swell. You are seeing near-sightedness demonstrated. You see a man who couldn't see his friend, Mr. McCormick, 10 feet away, but he is able to read print held near to his eyes.

Now let's see how we can detect the near-sighted worker when he first comes on the job and take steps to have his vision corrected.

The near-sighted fellow comes to work and he says, "Good morning, Mr. Anderson." He is all set to go to work. He goes over to the bench. He is a very close worker. You saw that demonstrated. Then a new jet goes over the plant, and all of those without eye defects go out and look at the new jet. But the near-sighted fellow says, "I can't see it anyway. What is the use of going to see it?"

About that time Anderson, the boss, comes through and says: "Doing a pretty good job. Right on the beam. Good inspector. Right on the job. Come on over to Building 6. I am going to get you another job."

The man with the eye defect goes off with the boss, but a big hook comes down the line and almost hits him. The boss says, "What's the matter? Didn't you see that big hook?"

The fellow says: "I didn't see it until a gal right on top of me. You know, I can see fair close, but I can't see far off."

"Yes, I notice that. Why don't you do something about it?"

"I've been wanting to, but I keep putting it off."

"Now you go down to the doctor and he will O.K. an eye examination."

The Doc says that he will see that the fellow, "E.D.," gets fixed up.

"What do you read on the chart?"

He says, "What chart?"

"E.D." stands up and he sees the "E." So the doctor starts working on him. "Is this better?" "Is that better?" With each lens he gives this E.D. he sees better. A plane goes over the building. He says, "Gee, Doc, I never saw one that high. I never see them after they take off. I hear them. Can I take the glasses home with me?"

"We will write a prescription and you take it over to the optician and have it filled."

He is very happy. He grabs the prescription, pays the fee and out he goes to get the glasses or he goes down to the Safety Department to have safety glasses made.

We have seen how the near-sighted man appreciates his new glasses. Now let's take the case of a far-sighted fellow and see how we can detect this condition. Safety engineers should be able to diagnose these cases for often men need glasses without realizing that they need them.

Let's deal with the far-sighted fellow—"N.E.D." How does he go to work?

He comes to work with the idea of making more than anybody. "Hello, boy. How are you doing?" But about half an hour after he starts working, the hands slacken. He goes to see the nurse. "The beer must have been a little green that night. Give me a little heartbreaker. I am sick to my stomach. The grapples are no good."

But this guy has to work, you know, anyway. He starts again. Then he gets sicker. He figures: "The lights are bad here. This place stinks. They are a bunch of dumb chucks. What a beating I am getting around here."

He starts in again. "To hell with the goggles." Down they come and pieces of glass and foreign bodies are flying all around him.

Anderson comes through about that time and says, "What seems to be the trouble?"

"What do you mean—trouble?"

"Well, you are not wearing your goggles."

"I know I am not. They're too heavy. Too hot. Make me car sick. This place stinks. The light is bad. You give me a bunch of dumb chucks to work with."

Everything is wrong. It's pretty hard to tell that fellow that it might be his eyes.

So what happens? Anderson says: "You have those goggles. Those are the best we can buy. Why we investigated them all. We liked you when you came. We hoped you would stay, but I would sooner send you home now and fire you than send you home blind and tell your wife and kids something happened to you. Has it ever occurred to you that it might be your eyesight?"

"Listen—take care of your own eyesight. I can see clear in to Elgin from here. Nothing is wrong."

"Listen, 'N.E.D.,' give it a whirl. There government people told me that 85 per cent of the objection to wearing plain safety glasses was overcome during the war by incorporating the correction underneath the cover-alls or right into the safety glasses. Give it a whirl. I'll bet you money, marbles or checkers that a professional man will come up with some good information for you."

"All right. Give me the name of one of those fakers." Down he goes.

Down he goes to the eye doctor.

The eye doctor says, "What can I do for you?" He says, "Not much, Doc. Anderson sent me in to have my eyes examined. I think he is nuts. I have no eye defect."

The doctor sees the premature wrinkles and crow's-feet and all the indications. He washes his hands and says, "What do you read on the chart?"

"What do I read on the chart?"

He is getting mad at the doctor now because this monkey reads everything on the chart—even the trademark and where the chart is made.

So the doctor starts working on him. "Is this better? Is that better?"

This guy thinks he is getting the business from the doctor. He pushes them up and shakes his head. The doctor doesn't tell him anything. Finally he says, "O.K." He takes the lens off. "That will do it for you."

"What are you going to give me glasses for? I read everything on your chart."

"I am not going to give them to you. I am going to write a prescription. Take it to your optician and have it filled and wear them. You will be very happy with them. Here you are."

So he takes the prescription to the optician, who tells him to return in several days for his glasses. Still irritated this fellow goes home to his wife.

"What is the matter with you?" she says.

"I went to Dr. So-and-So to have my eyes examined."

"Listen, honey, that doctor is a fine eye man. He took care of so-and-so. Maybe your eyes are responsible for your irritable spells?"

A few days later he goes to the optician to pick up his glasses. He puts them on and begins to count out the money to pay for the glasses. The money looks like it is jumping away from him. He looks up at the clock and he can't tell what time it is with the new glasses. He gets up and the floor feels like it is way up. He looks at the optician and the optician's face is all out of focus. "What's the matter with me? I was all right this morning." The optician sees his predicament and walks from the counter and gets him by the arm and helps him out. He now is not into the joint but he has to be helped out of there.

Out to the plant he comes with his glasses in his hand. He is looking for a guy by the name of Anderson. "Mr. Anderson, I was able to see where I came in this plant. I was getting along fine and doing my work. You sent me to an eye doctor. I read everything on his chart. He sent me down to get glasses. You've supposed to keep me safe in this plant and between plant and home. I put the damn glasses on and was nearly hit by a bus."



Let's interrupt our story for a moment in order to better illustrate N.E.D.'s condition. I want Mr. Fowler to take his glasses in his hands and look at the ladies and gentlemen back there. Move your glasses up and down. When you move those glasses up, things don't move with the motion of the glasses. They move what way?

MR. DON FOWLER: Opposite.

MR. BOWMAN: Side to side. Now that is far-sightedness. You see all right without glasses?

MR. DON FOWLER: Well, I don't see out of this eye.

MR. BOWMAN: Generally, why do you wear those glasses?

MR. DON FOWLER: For far-sightedness and strain.

MR. BOWMAN: I want this gentleman from the audience to move his glasses.

MEMBER: Everything moves opposite.

MR. BOWMAN: Rotate them. Why do you wear glasses? You could go home without those glasses.

MEMBER: I have to wear them all the time. Everything is blurry.

MR. BOWMAN: You have blurred vision. If you broke those glasses, this will give you a swell idea of how it would be.

Now, would you stand up, sir? You can distinguish who I am. Would you mind reading the *Readers' Digest*?

SECOND MEMBER: I can't read that.

MR. BOWMAN: That is one of the nice things about being 35 or 40. Doctors have told me that when you are ten, the lens of your eye has reached the maximum development. Each two years as you grow older, the lens of your eye loses some elasticity. When you get to be 35 or 40 you have to hold the printed page farther from your eyes.

That is when you need bifocals or trifocals. I have on trifocals right now. I couldn't tell whether that was a Gideon's Bible, a telephone book or what-have-you here. When looking over blueprints, I use the middle lens.

Now getting back to N.E.D.'s case. The near-sighted fellow sees fine with glasses but here we have the fellow who doesn't

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see very well. As soon as you discover he is far-sighted and has astigmatism, you must take "N.E.D." and say, "Wait a minute. I know you can see, but you see with effort. Your eye examination has shown a far-sighted condition or astigmatism. It is only a matter of a couple of days, a week or a little longer. There is going to come a time when your brain will tell your two eyes to accept this far-sighted correction and then you will be able to do a better job and do it easier."

You have to sell "N.E.D." on that. You safety men must do that with a man wearing this correction because he is still working like a horse pulling a horse. You will find that the fellow will not admit that he has become accustomed to his glasses and that he is doing a better job easier. He won't admit it.

After a few weeks Anderson comes by and says, "How are you getting along with your glasses?"

"Come back and see me tomorrow. I am too busy." He won't tell his wife even when the day arrives and he becomes accustomed to his glasses. His jitteryness and nausea, if eyestrain was causing it, will clear up. He wears his safety glasses better.

But what happens? About that time, he is upstairs shaving and he leaves his glasses up there some morning. His wife says, "Better hurry up." He gets in the bus, speaks to the operator, reads all the signs in the bus, even takes a sneak at the other fellow's newspaper across the aisle, goes out to the plant, walks through the plant, saying, "Good morning, Sergeant," etc., punches the time clock at about that distance, gets over to the bench and picks up the dope sheet for the day that is lined out and he can't read it!

"I saw before I got the glasses. Now I am blind without them. This guy Anderson has ruined my eyes."

You have to take N.E.D. and give him a moving picture and point out to him the conditions, characteristics and features of far-sightedness.

It is a job of selling. You have to watch the eye muscle deviation. So many people have one eye that wants to deviate away from normal. If the eye is closed, one eye will kick in. Under anesthesia, it will do it, and after a couple of drinks.

As far as safety glasses are concerned, on our property, we use the best. Here is a pair of glasses that were fitted to one of our men (demonstrating). Myron Cook could not work without glasses. Myron had these glasses on while he was installing a heavy trackless line. A short circuit caused molten copper to be blown into his glasses. The copper imbedded itself in the glass, but his eyes were saved. I have publicized that quite a bit.

Then there was the boy whose glasses saved him from chips of granite block which hit his glasses seven days after he started wearing them. We gave the boy quite a play.

I have spread trouble shooters over the 75 square miles of our property and I intend to do that among 11,000 city employes. They meet regularly and have lectures on the proper fitting of lenses.

These trouble shooters adjust goggles on the job.

I have 14 pairs of glasses with me. I hope to see the day when I can encourage the wearing of these among skilled workers. I don't know of a hazard that they haven't made some sort of eye protection for.

This is one of the things that helps me put over my own eye program. One of the hardest jobs that I have is to get the floating population of the track gangs to wear goggles.

I don't care what screening you are doing, the psychology of screening will have a great effect on your eye program. But more and more every day, it comes down to dealing with Joe Doakes in an individual way. You must study his particular problem.

When you get back home and have a little time, walk up some evening before your mirror and say, "Through those eyes, I receive 87 per cent of my education and have 80 per cent of the control of accidents. I never thought of that." While looking at the two pupils, reach up and turn off the light. Stand for 10 seconds and say, "Where would I be if I lost my sight?" Point a finger at yourself and say, "What are you doing about your own eyes?"

If you say that and mean it, you are going to furnish eye ease and vision efficiency, up to standard and have better contentment among the workers. It will not solve all your problems, but it is going to be very helpful. When you get closer to the people and start explaining the importance of vision and all its ramifications, you will get fewer accidents in your plant, railroad, city, community, school or home.



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**Current Safety Topi s in**

# INDUSTRIAL NURSING

**As presented in the Industrial Nursing Sessions of the 1948 National Safety Congress**


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**Volume 14**
**Transactions**
**1948 National Safety Congress**

NATIONAL SAFETY COUNCIL
Wacker Drive • Chicago 6, Illinois

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# What's New...

*In safety, as in all other human activities, the question is repeatedly asked, "What's new?"*

*Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.*

*Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.*

*The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.*

*In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.*

## THE INDUSTRIAL NURSING SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Industrial Nursing Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Industrial Nursing Section carries on in behalf of its members, and for the benefit of accident prevention work in industrial nursing generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of industrial nurses. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on page 19 of this volume.



## Annual Report

By HAZEL H. LEEDKE, R.N.
Thilmany Pulp & Paper Co., Kaukauna, Wis.

Again last year, another 100,000 persons came to an untimely death due to accidents. *But,* only 17,000 of these were in industry, leaving, as you can see, a tremendous toll due to accidents in the home, on the highway, and numerous other places. To me, it is the greatest evidence that safety programs pay in life-saving.

The loss of life through accidents has become so impressive, that on September 27, 28 and 29, there was called a meeting of experts to Washington, D. C., to attend the President's Industrial Safety Conference, to draft plans as to how safety could be extended to greater numbers. If safety programs pay dividends in certain plants, why can't they be made to pay to all. Safety must be extended beyond your plant—which I assume must have a safety program, or you would not be here.

As your retiring chairman, I would like to leave this message with you—do not hide your light under a bushel. Your position as an industrial nurse provides many contacts outside the plant; it offers certain civic advantages and responsibilities, if you are only aware of them. Make it your personal obligation to help sell safety to your community through cooperation with civic groups, schools, P.T.A.'s, service clubs, women's clubs, etc.

It has been a pleasure to serve this section as general chairman these past two years, and to serve on the Executive Committee the previous two years. I want to take this opportunity to thank the various committee chairmen and members of their committees for very fine cooperation.

I also wish to thank Miss Jane S. Weir, our staff representative from the National Safety Council and secretary of the section, for the very willing assistance given. Miss Weir has a great deal of the clerical work of the section coming across her desk, and it is she who answers your letters, gathers up materials, and investigates the reasons why you may not have received a newsletter. Be sure to feel free to write Miss Weir at any time for help.

I want to express my thanks also to others of the Council who have been so very cooperative to work with—Mr. Roche, Mr. Baltzer, and Mr. Johnson, to name only a few. My association with the Council has been a pleasure and an experience I shall never forget.

To Miss Joanna Johnson, past general chairman, I wish to express my appreciation for the guidance and counsel she has given me. If I can be just one-half as helpful to the incoming chairman, I shall feel very good about it, indeed.

## Off-the-Job Accidents and Their Relation to Lost Time in Industry

By E. V. "Al" JOHNSON
Safety Supervisor, Kimberly-Clark Corporation, Neenah, Wis.

So that we will all agree on the meaning of the title, let us recognize an off-the-job accident as one suffered by an employed individual while he is away from his job and is not carrying out an assignment in connection with his occupation.

Statistics tell us that of the 100,000 persons who met death through accidents in 1947, 17,000 (or 17 per cent) of the total were on-the-job fatalities. This is a tremendous direct and indirect loss to employees and employers concerned with industrial activities. We in industry are constantly faced with a challenge to mini-

mize this number. That is a large reason behind the assembly of 10,000 delegates at the 30th National Safety Council Congress and Exposition. We hope to gather up some ideas for more effective industrial safety programs.

However, as pointed out by Mr. Ned H. Dearborn, president, National Safety Council, in an article published in the April 1948 issue of the National Safety News, 37,500 workers died in 1947 *from accidental injuries which occurred off-the-job.* This represents 37½ per cent of the total accidental deaths, or about twice the number killed on the job. Also, there were about 2,400,000 workers who suffered lost time injuries in off-the-job accidents during the same period.

In these figures lies an even greater challenge to the safety-minded people of the nation.

There is a tendency, I presume, to accept these figures dealing with a nation's experience with a shrug of the shoulders. "They are about the other fellow," we tell ourselves. But are they? Let's get down to cases and narrow our forms by looking at one state.

Let's take the state of Wisconsin. The average frequency of accidental deaths in Wisconsin is not the lowest nor the highest. *In fact, it is so close to average* that you might consider the experience as very applicable to your own state.

Figures for the past three years indicate that the annual average number of accidental deaths in the state occurred as follows:

Industrial accidents—142.
Street & highway accidents—[illegible]
Home accidents—822.
Farm accidents—157.

Let us break down one of these figures and see how workers or employed people are concerned. Are any of these people killed off the job directly concerned with industrial activities? The safety division of the Wisconsin Motor Vehicle Department has a complete summary of the occupations of persons killed in motor vehicle traffic accidents in the state during 1947. Let us review these figures.

| *Occupation* | *Number Killed* |
|---|---|
| Semi-skilled operatives and laborers | 186 |
| Students | 102 |
| Farmers and farm laborers | 88 |
| Housewives | 84 |
| Skilled craftsmen and semi-professional | 70 |
| Retired | 53 |
| Business Men, clerical sales | 52 |
| Not stated or unemployed | 44 |
| Commercial drivers and traveling salesmen | 41 |
| Pre-school age children | 32 |
| Professional | 14 |
| Protective and service workers | 6 |
| Military | 4 |
| Domestic Servants | 4 |
| Total | 780 |

So it is obvious that personnel employed in industrial activities represent the largest groups of those killed in motor vehicle accidents. We will be safe in assuming that many years of experience and training for leadership are lost through these deaths. Fellow workers lose working partners. Communities and families lose wage earners and loved ones.

We still are not personal enough if we deal with figures concerning a state, so let us see what happens in a community. The area which I have a few figures on is not a large community nor is it exceptionally small—let us say it is *just* average—*your* community and *my* community. In the county of this community there have been 23 traffic fatalities during the first 9 months of this year. Four of the industrial plants in the community, employing a total of 5,678 people, have their nurses maintain accurate records on *lost time* accidents *suffered* off the job by their employees. For the first 9 months of this year these 5,678 employees have suffered 282 such accidents and in addition to much physical suffering and worry, they have lost a total of 2,622 wage earning days. In addition there were several deaths. Assuming there were about 225 working days in the nine months, this means that an average of 12 workers per day could not go into these plants and do productive work to earn wages because of physical disabilities suffered from off-the-job accidents.



Are the people in these four mills familiar with any phases of safety? Yes, the employees each year carry out complete industrial safety programs to the extent that their average accident frequency rates are far better than the average of their industry. At least two of these mills have given recognition to safety programs for 30 years. It may be assumed the safety-mindedness of these people is above average.

What can industry do to reduce the maiming and killing of workers after they leave the plant or place of employment? It is expected that the safety-minded business leaders will carry out effective programs. Through years of experience it can be recognized that they with their employees have the know-how of putting across effective ideas on accident prevention.

Application of this know-how to the community field seems to be the problem. and there is no reason why techniques similar to those used in industry to teach the good in doing a job the safe way—the right way—cannot be carried over into community safety. There the industrialist can guide and advise while a community or civic leader carries the program to the public. This know-how may be concerned with the use of equipment comparable to wearing goggles or safety shoes, or it might be on the more difficult level of inspiring group action and cooperative endeavor.

It is impossible for any police department or group of safety minded people to police all the spots where accidents occur. Therefore, effective techniques, similar to those used in industry, must be used to get as many of the public as possible to "Think Safety!"

An example of the need for this thinking is shown through figures supplied in a book of street and highway accident data, "The Fifth Commandment," as published by the Travelers Insurance Companies. Eighty four and seven tenths per cent of the persons killed through such accidents came about because of the four following actions by drivers, (1) exceeding speed limit, (2) driving on wrong side of road, (3) did not have right-of-way, and (4) reckless driving. In 74.7 per cent of the cases involving fatal accidents on the highway, the condition of the road was *dry*. In 83.8 per cent of the cases where fatalities resulted, the car was going straight when the death-dealing crash came. Contrary to a general belief that most cars are in bad condition prior to an accident, the survey shows that 92.7 per cent of the vehicles involved in fatal accidents were in apparently good condition *prior to the smash-up.*

These figures truly indicate the need for *clearer thinking for safety.*

Assuming that you of the medical profession are interested in taking an active part in community safety, your first question might be "how can we get started?" Through contacts I have had on this activity, my suggestion would be to assemble representatives of various community organizations, service clubs, etc. and organize a community safety council.

Through a few gestures in our community we immediately found that such civic organizations as Chamber of Commerce, Homemakers, Lions, Rotary, Kiwanis, Business and Professional Women's, Outboard Motor, Rod and Gun and many other clubs were willing to cooperate and assist in a community safety effort. There were also the Police Departments, Boy and Girl Scouts, Ministerial Association, P. T. A. Groups, Recreation Departments, Fire Departments, Red Cross, V. F. W., Schools, Y.M.C.A. and Y.W.C.A., Insurance Boards, Trades and Labor Council, Boy's Brigade and almost every industrial organization as well as many other groups which offered to take part in any program. The general public *is* interested in spreading the safety gospel and representative bodies and agencies will work hard to put across the main points of accident prevention.

With assurance of interest, the next move could be to take out a membership in the National Safety Council and receive the services of Mr. Tom Burke, director of community safety programs. Mr. Burke can furnish prepared outlines on how to organize and operate community safety programs. His advice and counsel will be of great assistance for any type of a program. The success of the program will then depend on how a plan can be worked *out to* individualize the program to the certain community.

Some of the other sources for guidance will include state safety councils, national offices of organized labor, state industrial

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commissions, insurance companies, Red Cross and many others.

Perhaps a first move would be to distribute pamphlets and brochures of information on home, highway, farm, recreation, school and general public safety. These would serve as generators of "Thinking Safety."

Many of the popular suppliers which we have found are the National Safety Council, Red Cross, insurance companies, National Conservation Bureau, U. S. Dept. of Labor, state safety councils and industrial commissions and others.

Some of the most popular pamphlets are: "Off-the-Job Accidents and You," "Jonesy's Off Today," "Safe Worker," "Thank You Mr. Executive," "You Can't Laugh It Off," "Mass Murder—American Style," "Safe at Home," "Hold Everything," "Invitation to Live," "Six Murderous Beliefs," "I Just Gave My Seat to a Lady," and others. These publications are secured free or at a reasonable price and when distributed they will be recognized as good messages on safety for everyone.

There is no universal method by which these publications can be distributed through your council to receive the most efficient results. Each council must have an individualized program which is most effective in their own community. They will "be in business for themselves"—doing it to suit the home folks. If handled properly the effort would not necessarily be on the "selling" of these ideas as it would on the part of the public to "buy" what is offered.

Community safety programs have materially reduced accidents in large and small towns as well as in large and small states. The more programs there are in effect the more the safety messages will reach all people.

So, we in industry have the tools available to coordinate good community safety programs. Assuming the responsibility of initiating such programs is our duty as citizens and representatives of industry.

In presenting these ideas to you I hope you will not assume that you are now expected to go out and "save the world." No, what I have tried to point out is that the best way to attack this problem is to set up our own little activities in our own communities. In other words, "paint our own little corner white."

In a broader sense we can recognize that activities for prevention of accidents, whether classed as on-the-job or off-the-job, makes for good living and is good business.

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## Chemical Eye Burns

By RALPH S. McLAUGHLIN, M.D.
Charleston, W. Va.

For the past several years in almost every meeting where nurses and doctors gather for instruction in modern medicine we find chemicals taking a more prominent place in the schedule. To those of us actively associated with the chemical industry it is apparent that the reason for this is the rapid progress of chemicals and their increasing importance in everyday life. To others outside of the industry it may seem unnecessary to give as much attention to a subject that does not involve them. Analysis of the situation, however, does not reveal that there are uninvolved sections of industry for chemicals are used almost universally. Study of these chemicals will surprise many of you for now you will find not only the old standard inorganic materials such as sulphuric acid and others like it, you will find new names and they are the new organic products which are finding more and more uses in our daily lives.

Very little attention was given an eye that was lost because of an acid burn. People accepted the fact that little could be done for such a burn of the eye, but now we have a new situation in which an eye is burned with, say, acetic anhydride. Few people hear of that product and their reaction is of course, "Well, can't something be done about it?" That question is asked of us in the medical field, and we must have an answer. Our answer is that something can be done, but it must be done in a certain way and with a set technique.



For the past ten and one half years I have spent a considerable amount of time studying this subject and have seen the prevention and treatment of chemical burns of the human eye develop from a very very unsatisfactory method to one that now prevents thousands of injuries and cures more than 98 per cent of those that are injured.

No injury is as successfully treated as the one that is prevented from happening, and I derive considerable pleasure when suggestions from the medical department stop injuries from happening in certain areas of an industry. Close contact with the safety group is necessary and it has been my experience that most safety men welcome suggestions. To me, the safety and medical departments are a team that must work together for the welfare of men and management.

I should like to add another department to the team that combats eye injuries and that is personnel. A liberal-minded personnel department allows us to care for the men in the best possible manner. In all of the plants for whom I act as consultant I require this attitude, for then I can transfer men to jobs that can be done by a man having a sore, bandaged eye. I can also have them in the dispensaries for needed treatments, and I can have them to the office for my work. All of this must be on company time, and while there is loss to the company in labor there is a greater gain to the company in moral of the men.

Too much stress cannot be placed on prevention of accidents in any plant. I find that this prevention starts with the screening of men to be employed, selecting only the best, so far as is possible. Follow this with an active safety crew that understands the problems of eye injuries and give them enough authority to handle the work. Finally have a trained medical crew that knows what to do when an injury takes place. Give me the above plus cooperation of management, and I will reduce eye injuries and cure most of the ones that do take place. I realize that this is a big order, but I have used this program for a number of years, and it pays dividends.

Now we shall get to the actual medical treatment of a chemical burn of the eye. The routine divides itself naturally into three sections: namely, first aid, dispensary treatment, and specialized treatment. Your interest will fall mainly in the first two, but your influence will bring the third into effect by your consulting medical staff.

No paper on eye safety would be complete without serious emphasis on prevention. In any plant where chemicals are used, adequate teaching of the nature of the materials comes first. Regular classes of instructions should be held especially for new employees. There should be discussed what chemicals can do; how to inspect equipment; jobs where accidents happen; and what safety equipment is made available, such as safety glasses, masks, and what not. Of major importance is teaching the men what to do if they *do* get hurt.

Our case opens with a man being injured with an organic chemical. This chemical plant has a wash-fountain installed and ready to use. These fountains are located in all parts of the plant and the men know how to use them.

Now about the washing on the job. Fountains are very fine but not entirely necessary. The washing can be a copious flushing with ordinary tap-water. In the absence of efficient equipment a bucket will do, but five minutes of copious washing is the rule in this plant.

The foot-controlled fountain is convenient, for the lids can be opened and washed by one man only, but encourage fellow-employees to help for burned eyes hurt and cause desperate excitement which may delay water reaching the eye. The rule here, then is: wash quickly, copiously, and long.

Next, the injured employee goes to the company dispensary. No time is lost getting started. Go right now! No question should be asked by management as to the need for going; it should be encouraged for time is of utmost importance in a chemical burn.

A modern well-equipped dispensary is set up to take immediate care of such a chemical injury. Carbide is a large plant and can have such a set up with doctor, nurses and all of the fine equipment, but don't let this hold you back in caring for your men.

Another plant in our Magic Valley which

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cannot maintain such a set-up has obtained equally good results with this routine: The men handle the work themselves and the young lady pay-roll clerk, with no medical education other than that which I have given her, handles the little treatment room in the corner of the employment office.

Now I approve of the complete set-up, of course, but the bare necessities are as follows: ½ per cent pontocain for anesthesia, a bottle of 2 per cent fluorescin for staining, a large bottle of normal saline with siphon for washing, and a basin in which to catch the water. A Beck chair is fine but any chair will do as long as the eye is washed.

Note the procedure: The eye is anesthesized and stained, gross particles are removed, for with the eye asleep complete examination is possible. Then the washing starts and lasts fifteen minutes, covering the entire eye and the folds of the conjunctiva. Fluorescin is again applied, and if stain is still present, another fifteen minutes of washing is done. If at the end of half an hour of washing stain is still present, the eye is considered to be a serious burn, and the employee is referred to the ophthalmologist for specialized treatment.

Specialized medical care must be done on an emergency basis, if successful results are to be obtained. We believe that four hours is the maximum safe elapse of time between the injury and the completion of the specialized care. We have proven that the chemical adsorbs on the epithelial cells without change in chemical composition, and that as such it progresses through the epithelial layers until vital structures are affected. Since epithelium is replaced in kind, it is possible then to remove the chemical before it reaches Bowman's Membrane and we can expect prompt healing and an undamaged eye.

We have called the removal of the affected cells denuding for we actually do remove all affected cells. Under the high power of the bio-microscope these affected cells are seen as irregular shaped translucent opacities by retro-illumination, and as green Fluorescin stained patches by direct illumination.

Preliminary examination will give the operator a very good diagnosis of the depth of the burn and after a few drops of 4 per cent cocaine are administered, the actual denuding is started. A small tightly wound dry cotton swab is used to remove the affected cells beginning in the center of the cornea and progressing toward the limbus with a circular motion. Just enough pressure is used to slightly distort the cornea. Frequent checks on the bio-microscope must be made, and only the affected cells are removed so far as is possible.

I have tried to picture the before and after appearance by means of colored paintings in the movie and they may seem very crude but insurmountable difficulties made it impossible to have real pictures.

Following the removal of all of the affected cells the eye is flushed with stainless merthiolate and closed with sulfathiazole ointment. A tie-on patch is used as there will be much pain and this offers a convenient cover which can be removed at will for treatment. The patient is warned that there will be much pain, and he is furnished with pontocain ointment to use as frequently as needed. Occasionally due to a low pain threshold we find it necessary to add general sedation to the routine.

We have made it a regular practice to record at the first visit the presence of focal infection or other general health problems. No treatment is instituted at the first visit.

The following day the patient is seen again and the eye inspected under fluorescin stain. Many cases will be found to be completely healed and may be discharged without further treatment. The unhealed cases are again dressed with sulfathiazole ointment following cleansing and flushing with stainless merthiolate. The same anti-pain treatment is continued.

On the third day the eye is again inspected and if not then healed, the eye is considered complicated and intensive combative treatment instituted as indicated. The eye is lightly sprinkled with methylene blue powder and flushed with saline. An intramuscular injection of non-specific protein is given and the patient instructed that there is complication and that more drastic treatment may be needed the following day.

From here on the case is regarded as an infected corneal or conjunctival ulcer and the usual routine already familiar to all of you is instituted. If focal infection is present we now hospitalize the patient and start fever therapy removing teeth or tonsils on rest days from the fever treatment. Other infectious areas are treated as indicated. We have had no ill effects from such surgery, in fact many cases have been brought to a satisfactory cure by it.

After final healing does take place the remaining opacities if any are treated with 1 per cent solution of choline chloride as drops every three hours. We have found this material very effective in fading the light opacities of the cornea and much less distressing than the usual dionine. The choline chloride is discontinued when the opacity is gone or when no further improvement is noted by microscopic study.

In the selection of drugs to be used in the burned eyes there is found considerable variation of both types and method of use. We use sulfathiazole ointment for the first forty-eight hours, only one application daily, since we believe the eyes to be relatively aseptic. Following this holocain and epinephrin is found to be satisfactory in the slow but uncomplicated case.

Pontocain ointment is used as needed for pain. This routine has produced only a rare sensitivity and in our series of cases has not impaired healing materially. Penicillin ointment was used in a short series of cases, but many sensitivities were produced and we do not use it at all now since its effectiveness is no better than the above routine, and we do not like to establish a complication which might restrict its use in other conditions where its effectiveness is great. Solutions of penicillin were tried but not continued for again no improvement in results were found and the time element for the mixing of fresh solutions was an added burden. No sensitivities were found in this use.

In closing let me beg of you to learn how to handle these injuries and remember, if our attendance here results in the saving of only one eye by this whole group then my time and yours has been well spent.



## Evaluating the Services of the Industrial Nurse

By LUCILLE HARMON, R.N.
Assistant Professor of Nursing, Wayne University, Detroit, Mich.

Evaluation may be defined as an appraisal of the usefulness or effectiveness of something. Evaluation implies analysis and interpretation. Rating is a mathematical grading by which the individual is measured against a standard of performance[1]. Rating may be the first step, but only the first step, in preparation for evaluation in which each item on the rating scale is analyzed in terms of professional accomplishment. Rating without evaluation has no validity applied to professional service.

The rating process in which the worker's efficiency is determined by the number of parts his machine has turned out in a given period of time is commonly used in industry, but industrial nursing service cannot be measured quantitatively. It is influenced too much by professional skills and human relationships.

The management which places emphasis on the number of treatments a nurse is able to give in an eight hour period is getting a service which can be measured quantitatively, but which is as mechanical as the assembly processes in the plant. Such management is realizing only forty per cent of the potential value of its nursing service[2]. Evaluation, which is a function of professional supervision, must have as its objective the improvement of the nursing service, and service can be improved only through the professional development of the nurse.

The objectives of an industrial nursing service are determined by plant health policy. If plant policy limits nursing service to remedial treatment of injuries and illnesses of occupational origin, the objectives of the service are clearly defined, sharply limited and easily evaluated. At least it would seem so at first glance. But even in such a limited situation quantity and efficiency are not the only items to be

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measured. Judgment, skills, teaching, human relationships are factors which must be taken into account in evaluation and they are factors which do not easily lend themselves to exact measurement.

The criteria for the effectiveness of an industrial nursing service are also determined by plant health policy. The manual of procedures is the written expression of management's objectives in establishing a nursing service. It defines, limits and extends nursing functions.

Job analysis must show a correlation between plant policy and nursing procedure. The criteria of the effectiveness of a service may relate to frequency and severity rates, to compensation costs, to illness absenteeism, to employee morale—factors which are difficult or impossible to measure in terms of nursing effectiveness.

Evaluation involves four essential procedures[4]:

1. Setting up standards against which to measure nursing performance.
2. Collecting information about the performance of the individual nurse.
3. Relating performance to the standard.
4. Interpreting the results.

The first procedure is a task which industrial nurses must do as only they are in a position to know what skills and knowledge are needed to render an effective nursing service to employed persons. Job analyses of a large number and variety of nursing programs should serve as the basis for the professional standards of nursing performance.

Standards in use in other professional fields such as in public health nursing, social work and education provide a pattern which may be used in establishing standards for industrial nurses. Such items as aseptic technique, skill in carrying out specific nursing procedures, scientific knowledge, approach to patients, feeling for people, ability to teach health effectively, personal appearance, interest in work and in professional development—all properly have a place in professional standards.

The proper and widespread use of such a standard would inevitably raise the level of industrial nursing performance. The standard-setting procedure must be the task of a duly appointed group representing industrial nurses. The subsequent steps in evaluation are the joint responsibility of the persons directly involved; namely the nurse whose service is being evaluated and the one who is making the evaluation.

It is at this point that difficulty is encountered. The question is immediately raised—who may properly evaluate industrial nursing services? If we accept the premise that evaluation contributes to the professional growth of the nurse, and that service improves only to the extent that the nurse's knowledge and skills are implemented, then we must accept the conclusion that evaluation is the prerogative of one thoroughly familiar with industrial nursing functions. This implies experience, maturity and objectivity. Experience and maturity enable the evaluator to judge quality of performance in relation to accepted standards and objectivity enables her to focus attention on the job rather than on the nurse.

What the nurse is, is important only when it affects her work[5]. Management is in a position to evaluate nursing service only to this extent—how well the service meets the objectives management has defined for it. These objectives may be limited to the provision of remedial services for injured employees with the only criterion the reduction in compensation costs; or the objectives may be broadened to provide services for the promotion and maintenance of employee health and welfare with the effectiveness of the service measured in terms of how well it meets the total health needs of the plant population. Management cannot evaluate nursing performance, but should make it possible for the nurse to have her services evaluated.

In the business enterprise large enough to have a staff of nurses with a nursing supervisor and some in-plant medical direction, evaluation is the joint responsibility of medical director, supervisor and staff nurse. Evaluation must be based on total work, not only on certain portions of it; it must be a continuous process, not limited to occasional study. It implies observation of the nurse in all types of work activities; analysis of her records; opportunity for her to discuss her work problems; knowledge of her professional background; her capacity for accepting responsibility; her ability to work with people; her interests in her own professional growth and her health record. However, it is not enough to have a knowledge of the nurse's strengths and weaknesses and to measure them in terms of professional standards. There is still the fourth step in the evaluation procedure—interpreting the results.



Interpretation is the most important and the most difficult step in the evaluation process. It demands objective analysis, mature judgment, careful consideration of all factors in terms of the progress the nurse has made, her interest in continued professional development and her motivation. Only on these terms can the nurse accept evaluation as a stimulating and constructive process.

If she is compared with someone else whose background and experience may be totally different; or if the approach to her is overly critical; or if she feels the supervisor is unfair or not really interested in her the process can be painful and even destructive. Evaluation is a vital part of democratic supervision; without it there can be no real progress in the improvement of nursing services, but it must be a continuous, democratic process based on the knowledge of individual differences in the nursing staff—differences in educational background and life experiences as well as in the rate of learning.

In the small business enterprise where the nurse works alone, or there is one nurse on each shift, or two or more nurses are working together without supervision the problem of evaluation of service is much more complex. It is the rare nurse who has reached the level where she can be objectively critical of her own activities. The physician's contact with the service is too brief and infrequent to permit him to make a considered judgment of the quality of the service. Management can measure the effectiveness of service only as it meets their objectives and these objectives may be poorly defined.

The situation in which the inexperienced nurse in the small plant finds herself does not need to be detailed here. We are all familiar with the adjustment which must be made by the nurse whose professional experience has been limited to a hospital environment. From whom, then, can she get the kind of help she needs in evaluating her service?

At this point in the development of industrial nursing that help can only be secured through the consultation services of the state and local health departments and through those insurance companies that provide such services. There are weaknesses in this kind of evaluation because it can be neither a continuous nor a total process. When, however, the evaluator is mature, experienced and objective the evaluation process can be professionally stimulating to the nurse with resultant improvement in the quality of her service. It stimulates her to see her job as a whole and helps her to gain insight into her problems.

To be effective the purpose and process of evaluation must be clearly understood by both nurse and consultant; evaluation must be worked out jointly and must be done objectively; and to demonstrate progress it must be done at regular intervals. I am fully aware of the difficulties in working out such a plan where one or two industrial nursing consultants must cover an entire state, but I know of no more effective use of consultant time than to improve the quality of industrial nursing service through helping the nurse to achieve maximum professional growth.

As in other situations there are certain elements in the small plant service which are most easily evaluated—the physical environment in which the nurse is working, the adequacy of the equipment with which she works, the orderliness of her procedure, her personal appearance, her techniques, records and so on. Even with these objective elements conclusions cannot be based on observation alone. The evaluator must have full knowledge of the physical facilities with which the nurse started the service, the obstacles she has had to overcome in acquiring equipment meager though it may be, the progress she has made in stimulating management's interest and cooperation in the health program. Much more difficult to measure are those other elements without which the nurse cannot make her maximum contribution to industrial health—the ability to work effectively with people, to teach health effectively, to give guidance and help in emotional crises.

To summarize briefly, the proper evaluation of industrial nursing service which has as its goal the improvement of the service through the professional development of the nurse can substantially raise the level of *industrial nursing performance*. There is a trend, especially in small business enterprises, to relate salary increment to quality of performance rather than to length of service. The objectives of the service as defined by management can be enlarged, and will only be enlarged, as nurses demonstrate their ability to improve the quality of performance and increase the scope of their services. This is a task which industrial nurses must assume.

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## The Cardiac in Industry

**(A summary of a talk)**

**By C. M. KURTZ, M.D.**
**Madison, Wisconsin**

Dr. Kurtz directed his talk primarily to nurses employed in industrial plants. He reviewed the prevalence of heart disease in the general population and suggested ways and means of absorbing workers afflicted with heart ailments into industry.

The limitations imposed by heart trouble on its victims are extremely variable and a large percentage of so-called "cardiacs" are able to hold down responsible and productive jobs, if someone will take the time and trouble to see that they are placed in suitable positions. Even the more seriously affected can fill many "chinks" and free the more able-bodied for the bigger jobs.

Dr. Kurtz outlined the manner in which the industrial nurse fits into the picture, made concrete suggestions for the placement of heart victims in various types of work. He presented the immediate treatment of cardiac emergencies. He discussed one of the newer developments being tried out in certain industrial plants, that is, the routine use of the electrocardiograph in the screening, medical examination, and proper placement of employees.

## Rehabilitation of Handicapped Workers

**By STANWOOD L. HANSON**
**Assistant Vice-President, Liberty Mutual Insurance Company, Boston, Mass.**

Up to World War I, and possibly it could be said that up to World War II, it was generally thought that seriously injured workers were not employable in industry and had little if any productive capacity. Unfortunately, it is a provision of many workmen's compensation laws, even to date, that many major injuries create total permanent disability or permanent partial disability.

In 18 of our states, the loss of both arms, legs or eyes or any two thereof is ruled by statute to be a permanent total disability and the man thereby becomes a 100 per cent economic loss. In all states the loss of body parts such as fingers, toes, hands and feet is considered to be a permanent economic loss and schedule awards are made for them in some states in addition to payments for disability and in other states awards may be made as a percentage loss of the individual as a whole. Such laws imply that there is no rehabilitation for certain types of injury.



Subsequent to World War I Public Law 113 was passed by Congress and it provided financial assistance to states who undertook vocational rehabilitation programs. Education to the effect that handicapped persons could be re-educated to employability began to spread. World War II demonstrated, however, the real possibility.

It was during the war that the demand for labor exceeded any previous experience in our economic history and persons with virtually every type of physical handicap were employed. Through the rearrangement of production lines in many heavy industries, all heavy lifting was avoided and women and old men were employed to do work that had only previously been done by the strong and ablebodied. Blind persons were employed on assembly lines and, as a result of job matching which consisted of physical examinations to determine what the individual could do and could not do and the making of job studies to determine job requirements, persons with all kinds of infirmities were matched and placed in safe and productive employment.

In one war plant in Terre Haute, Indiana, which we insured, 131 men suffering with hernias were employed by the application of trusses and selective placement. At the end of the policy year not one of those 131 men known to have a hernia at the time of employment had reported an industrial disability due to hernias. These experiences conclusively proved that many of the earlier concepts were wrong and that persons suffering with many types of physical infirmities were employable.

Mr. Black, President of Liberty Mutual, years ago felt that there were numerous types of totally disabled individuals as the result of industrial injuries, who could be restored to employability if methods of physical restoration and re-education could be coordinated and applied. Early in the nineteen forties the claims department of Liberty Mutual had also become aware of the fact that in the case of the seriously injured, the period of convalescence which followed the early stages of hospitalization and surgery was a time fraught with many hazards to ultimate recovery and return to employment.

Often injured workers made excellent progress during the early acute stages of medical treatment or surgery but when the patient was discharged from the hospital and returned to his home to convalesce, progress stopped. This was often due to discouragement, fear of further injury or loss of confidence. Medical reports often reported the disability to be due to fixation of joints or atrophy of muscles as the result of disuse of body parts. Consultants and technicians who had worked with the handicapped told us that it was due to the lack of a program of physical stimulation, muscle re-education and graduated exercise to recondition the individual to a work capacity.

Their views were borne out by the experience which the English Air Force was having at that time in a program for reconditioning aviators and air crews who had been disabled in crashes and combat. This was at the time that Britain's small Air Force was standing off the air invasion by Germany. Aviators were worth their weight in gold and the Air Force Medical Corps were leaving no stone unturned to bring about their rehabilitation.

Methods of physical therapy and exercise were applied to injured flyers immediately following surgery. This was to maintain the good body function of the individual as a whole and to stimulate blood supply in healing of injured parts. It provided both mental and physical stimulus consisting first of exercise in bed, in the hospital ward and in the recreation rooms and from there to the gym, swimming pool, tennis court and golf course. Their literature reported that these methods not only returned many aviators to active duty who would not otherwise have been returned but hastened recovery of others. What appeared to be necessary, therefore, from their experience and our own was to provide a center where methods of physical medicine and physical restoration could be applied and carried out.

In response to the above need, Mr. Black of Liberty Mutual decided to found the Rehabilitation Center in Boston in 1943. The intent was that this should be a pilot plant to establish standards and to develop interest in physical restoration. We were guided entirely by medical advice in developing techniques in physical therapy, occupational therapy, work therapy and recreational exercise that could be applied to disabled individuals. It was to be a place where the physicians of New England who were treat-

ing the injured workers of our policyholders could send their patients to have their prescriptions for the application of physical and occupational therapy carried out under expert medical guidance and by trained technicians.

The nature of the treatment was to avoid or reduce joint stiffness or muscle atrophy and to give graduated exercise to re-educate muscles and to regain work capacity. The *workshop and recreational rooms* were placed where self-confidence and work interest could be stimulated in a coordinated program that supported the progress of the individual from disablement to employment.

Almost immediately after opening the Center we began to get encouraging results. Several cases of serious injuries to the spine which had resulted in spinal fusions were *admitted. These patients* were *discouraged* and apprehensive. They would, however, become absorbed in a game of pool and in making objects in the workroom for their own use. The interest involved in these undertakings was such that their fear and pain was forgotten, their confidence restored and muscle power re-established.

Approximately a year after we opened, we incorporated a program for employees suffering with major amputations. The United States Office of Vocational Rehabilitation in Washington informed us that over 80 per cent of the artificial limbs that were purchased for amputees were not worn. This matched our own experience.

Study of the problem soon demonstrated to our satisfaction that it is just as necessary for an amputee to receive a good fitting and to be taught how to use an artificial limb as it is for one to take music lessons after purchasing a musical instrument. Accordingly, we incorporated a program which was designed to assist the amputee first, in the selection of a prosthesis that fitted his individual situation and need, second, in getting a careful fitting and adjustment of the *prosthesis and third, in teaching him how* to use it.

Amputees need such assistance in selection of prostheses because they lack knowledge and experinece as to what will be most useful. Without guidance they usually purchase something that has eye appeal rather than a device that will serve the best functional purpose for them.

Lightness in an artificial arm or leg is an essential quality. A very light artificial leg is desirable for ease and comfort in walking and for a person who is going to do sedentary work, one of the new limbs made from some of the new light metals is excellent. for a laborer or farmer, however, they are not desirable because they will not stand the abuse and will get dented from the banging that they would receive. A reasonably light but tough willow leg is, therefore, much more desirable for an individual who would look forward to doing heavy work. The type of socket is equally important. For a person who is to stand for long periods of time at his work and who may have an above knee amputation, a leg with a manually operated locking device at the knee may be very helpful.

In 1944, the Surgeon General of the Army requested the National Academy of Science (through Congress) to undertake a program of research to develop better artificial arms and legs. The committee on *artificial arms was appointed and was made* up of medical men and scientists.

Three new artificial arms have been tested and approved by the committee and accepted by the Veterans Administration. They are the Northrop, Hosmer and Fitch Arms. The third arm is known as the Fitch Dual Control Arm. The Fitch like the Hosmer is for above-elbow amputations only. Artificial limb shops throughout the country have been authorized to distribute these prostheses.

These new arms are generally more expensive than previous models but have the advantage of being lighter and stronger and of having improved controls and greater range of motion.

It has been our experience so far that mechanical hands that operate either as the result of cineplastic operations or by control cords lack the strength, dexterity and wearing quality of a hook operated by shoulder straps and control cords. For example, a No. 5 Dorrance hook mounted on an artificial arm that is small at the wrist is excellent because it will go into pockets and the man can handle his pocketbook, change, pencil, cigarettes and matches.

Even a bi-lateral amputee can manipulate such combinations with sufficient dexterity to be entirely independent. One of the problems of rehabilitation is, therefore, to get the individual to disregard the cosmetic appearance of the artificial device and to select that which is going to enable him to have a maximum physical performance. For a workingman, mechanical hands lack dexterity, strength and they wear out rapidly. Hooks, therefore, are superior.

To bring about a good rehabilitation of the amputee the process has got to start at the very beginning. It must start with the surgeon first, in the selection of the correct site for the surgical amputation. All of the leading authorities with regard to the problem of amputees and the manufacture of prostheses agree that amputations should be done at a see of election anticipating the subsequent fitting of the most efficient prosthesis rather than try to save useless bone and tissue. For example, an amputation through the arch of the foot or the palm of the hand, if the thumb is missing, is not advised because no efficient prosthesis can be applied.

Charts illustrating sites of election for surgical amputations have been prepared by the Council on Physical Therapy of the American Medical Association and agree closely with such authorities as Dr. Henry H. Kessler and Mr. Earle H. Daniel who is prostheses consultant for the Institute of Rehabilitation and Physical Medicine which is a unit of the New York University-Bellevue Medical Center.

Dr. Kessler in his writings states that the problem of stump shrinkage following surgery is a heroic all-out undertaking in order that the amputee may have a good conical shaped stump for good fitting of prosthesis and for painless and efficient wearing.

The process of teaching the amputee the use of his prosthesis is first to show him how to use the device in order to meet the demands of daily living. If he is a bi-lateral amputee, he is going to be entirely dependent upon the prostheses in making his toilet, meeting all of his body needs including eating and traveling. It is possible to teach them to use a great many types of tools, to drive a car and to write.

We had one case of a bi-lateral below elbow amputee who had lost his hands when a press punch repeated. Just 7¼ months from the time of his injury, we returned him to his employer entirely capable of handling the job of a warehouseman's helper which paid incidentally slightly more than the job of press operator. *This we think* is an all time record for the rehabilitation of a bi-lateral hand amputee.

We have at our Center at the present time a *bi-lateral above knee amputee and a bi*-lateral arm amputee with one arm amputated above the elbow and one below, both of whom we fully expect to return to industry in suitable employment and at substantial savings in workmen's compensation loss costs to the employer.

The most serious of all disabilities are injuries to the spine which separate the spinal cord causing paraplegia or *in very* rare cases, of complete separation of the cord in the cervical region, quadraplegia. I know of only one case of quadraplegia that has accomplished any measure of self-sufficiency but I do know of numerous cases of paraplegia who have regained employability and we have a number of cases of our own who are in the process of rehabilitation and two of whom have already regained earning capacity.

We have one case at our Rehabilitation Center in Boston at the present time of a lady who suffered a complete paralysis of the lower trunk and legs as the result of a fall in an elevator and who is now able to get about with the combined aid of a wheel chair, crutches and cane and to take care of most of her physical needs. She is learning to become a typist and we fully anticipate that she will regain her earning capacity.

It is interesting to know that all the paraplegias of World War I are now dead with but one exception. Actually only a comparatively few ever returned to the United States and most of them died as the result of uremic infection. As the result of World War II, 1,700 victims of paraplegia arrived back in the United States from overseas injuries and most of them are alive today. They are alive primarily because medicine was much nearer the front lines in this war, because transportation facilities were better and because of the development of sulfa drugs, penicillin and streptomycin.

Our industrial experience with cases of paraplegia are similar. Where formerly most of these cases died within a matter of days, weeks or months, these new drugs



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will overcome the infections which arise from the paralysis of the bladder or from decubitus ulcers which, so frequently develop. These cases will be preserved for a lifetime of hospitalization and special nursing care. Wherein numerous of our compensation laws now provide hospital and medical services for a lifetime, costs on individual cases may run to $100,000 or more unless means of rehabilitation can be applied.

In some cases already known techniques of rehabilitation can bring about the return of earning capacity at sedentary types of employment in the most appropriate and apt cases. In other cases it can accomplish a rehabilitation from the need for hospitalization and special nursing care or from the need for institutional care or attendant care of any kind, in other words to a physical self-sufficiency. Even this type of rehabilitation can accomplish happiness and satisfaction of living of the individual as well as great savings in medical loss costs to industry.

Unfortunately few facilities for such rehabilitation exist in the country today outside of veterans hospitals. Rehabilitation here does not consist of restoring physical function because it has been irreparably lost, but it does consist of restoring bowel and bladder function and teaching the individual to carry out the functions of daily living with what he has left.

The techniques, however, are still in their infancy and much is needed to establish and perfect facilities to carry out this process of medical treatment, teaching and vocational education. All of these processes of rehabilitation, however, will fail in their ultimate goal without the cooperation of plant management and plant medical facilities.

One of the leading authorities on this continent on the subject of industrial rehabilitation is Dr. D. J. Gelbraith, Vice-Chairman, Workmen's Compensation Board, Toronto, Canada. He told me that he considered one of the most important factors in rehabilitation to be good counseling of the injured worker as early as it could be appropriately done following injury. By counseling he meant to give the worker encouragement, to tell him what was to be done for him on a program of medical treatment and rehabilitation, what he would receive as compensation benefits during disability and what was to be planned for his return to productive employment in order that he might know that all was not lost and that he would be able to regain economic security. *Through cooperation on the* part of plant management, plant medical departments and casualty insurance, such counseling can be carried out when programs of rehabilitation can be designed consistent with existing facilities.

If injuries have been of sufficient severity to cause permanent impairment to the individual, then a very important part of the rehabilitation planning is job matching and placement which will provide safe and productive employment. Also important is follow-up after placement to be sure that the placement has been correct and is succeeding.

You will be interested to know that we have admitted over 1,200 seriously injured individuals at the Rehabilitation Center since it was opened in 1943 and that of those who have completed treatment, over ⅔ have been restored to either total or partial work capacity. The overall results have more than fulfilled our expectations, and we know that the monetary savings in compensation losses to our policyholders has been substantial.

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## The Industrial Nurse and Public Relations

By H. J. SPOERER

Director, Industrial Relations, The Youngstown Sheet & Tube Co., Youngstown, Ohio

The increasing importance of industrial health has given a new impetus to the value of competent industrial nurses in both preventive medical programs and day-by-day service to employees in the plant. In a large sense, daily first aid medical service is dependent upon the calibre and qualifications of the nurse.



Industrial nursing has accompanied industrial medicine in evolving from the first aid station to a service that includes illness and accident prevention, health and safety promotion, and care for the sick and injured. They have both become distinct branches of their respective professions, and they stand at the threshold of a broad development in their services to industrial workers. They have both become integral phases of industrial management. We understand that there are better than 12,000 nurses engaged at present in industrial nursing. This development of industrial hygiene reflects the growth of American industry.

The industrial nurse's relationship to all personnel gives her a strategic value as interpreter of health practices and promoter of good will. Her technical skill makes her the indispensable ally of the physician in the first aid, diagnostic, and treatment aspects of industrial medicine. Her close contact with workers and her knowledge of community resources aid the doctor in rounding out his health examinations and in achieving corrective measures. Her ability to evaluate the character and importance of symptoms and to record them properly, make her a valuable adjunct in the compensatory and legal aspects of industrial illness and injury.

The nurse selected for industrial work must have an appreciation for the importance of maintaining good industrial and public relations. Her work with patients tests her judgment, resourcefulness, ability to fit into teamwork, and her capacity for using her energies effectively.

This basic foundation is essential in order to develop a good industrial and public relations consciousness.

She must possess a deep sense of responsibility to the workers, to management, to the medical director and to the community.

You may justifiably ask: "How do we as industrial nurses become involved in the public relations angle?"

The answer to that is that you are a part of business and industry. For this reason the first thing we ought to examine is what might be called the "climate of public opinion?" I think you cannot begin better than by asking what the American people expect of business and industry.

The American people want modern corporations to be good citizens. Understand that I am not referring here to the private lives of people in corporations but to our business and industrial companies themselves. They want our corporations to be efficient, productive enterprises, but they want them to be more than that. They want them to be aware of the social problems of our country and of the world and to take the time and trouble a good citizen should take to help deal with them.

It is my opinion that the American people have now fully accepted the idea that the corporation is in a sense a person. But, with infinite wisdom, they have added the notion that a person—corporate or otherwise—should have not only rights but responsibilities, not only privileges but duties, not only a head but a heart. They have said, in effect: "Go ahead and be a person and enjoy the rights given to free men, but remember that this means you must also accept the duties of a citizen."

This challenge has been met as, industrial hygiene has been pioneered by the larger companies and according to a report by Dr. Victor G. Heiser, Medical Consultant of the National Association of Manufacturers, with almost no exception, they have done a good job.

He points out, however, that almost 60 per cent of the people employed in industry work for companies employing 500 persons or less; and many of those employ only a hundred, or not even that many. How can these "little fellows" install a hygiene program that will promote production, that will help the company to earn the profits it is capable of? How can they afford to do it? The real question is "how can they afford not to?" Ways and means have been developed,* and have been proved practical by experience by which the smallest of the companies can get most of the benefits of the sound industrial hygiene program with-

*A cooperative clinic provides health services for the employees of six companies in Winder, Georgia. The program is administered by a board of directors made up of representatives from the participating companies. Services are financed by the organizations that share clinic facilities. Details of the program are described in The Management Record for October.

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out undertaking all the burdens. Philadelphia is a pioneer in having started an industrial medical service for small industries. More recently New Haven, Williamsport, Los Angeles and others have done likewise. We mention this to point out that the pioneer work of big business in industrial hygiene has also spread out to small business.

It is interesting to note that the various surveys conducted by the National Association of Manufacturers, The Conference Board, and others, all sound the same warning. While adequate training, experience and professional competence are considered essential qualifications for industrial nurses, these surveys emphasize that desirable personal qualities are considered equally important since many companies have discovered that employees "will not freely discuss their health problems with physicians or nurses who fail to inspire their confidence, or who lack sympathetic understanding of the many conditions (housing, economic, family) which might conceivably have some bearing upon the health and attitude of the worker."

It is a matter of agreement among both practitioners in industrial relations and public relations that "good public relations begin at home"—among the company's own employees. The Opinion Research Corporation in its Public Opinion Index has repeatedly shown how powerful are employee attitudes in molding favorable opinion about a company. We suggest reading the index report "How to Get Along in the Plant Community"—December, 1946. It has also shown that the trend is markedly toward closer collaboration between industrial relations and public relations.

It has frequently been said that first impressions are lasting impressions, and this is especially true when a new employee presents himself to the medical department for the first time. If the quarters are good, the equipment adequate, the interview and examination thorough, the applicant cannot help but be impressed. He cannot help but conclude that there is an organization which *does things right and which is sincerely* interested in the health of its employees.

Forty years ago industry provided only minimum medical attention, often engaging the first doctor to be located, regardless of his ability. Some of the results were poor and many people got an impression that full time industrial doctors were poor physicians. This is no longer true. It has been shown that the role of the medical department in industry is an important one. They stand ready to combat employees' physical and mental ills. They frequently act as counselor and family advisor. They promote good public relations and more recently have taken an interest in research projects which should pay substantial dividends.

The industrial medical specialty is gaining recognition not only with industrialists but with educators, public health officers and doctors. More and more companies are expanding the scope of their health maintenance programs, and some have engaged industrial hygienists to assist the physicians in collecting technical data on environmental exposures.

Like so many things in life, a good public relations record must be earned, and it is not a one man job.

Experience in studying the citizenship of industrial plants in their communities shows that *many plants* have done remarkable jobs in living right. That is, they have established safe, healthful working conditions; they work hard at increasing the security of the worker in his job; they try to pay good wages; they go in for all sorts of benefits for the workers. But when trained research people make a study in the community, they find that the public has little understanding or appreciation for the company's efforts. The reason is: many companies have made no effort to interpret themselves and their good acts to their employees and the community.

Often when employees are asked why did such-and-such a company make changes in their operations or establish some new benefit for employees, the answer indicates that the company was forced to do it. Often the management receives little or no credit for its effort to live right. This is a very general problem in public psychology. You all may recall that the Arabs came to the conclusion that the Englishmen were dirty people. They said they must be dirty because they take a bath every day. So in addition to industry living right, they have the added responsibility of interpreting their acts.

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**Volume 15**
**Transactions**
**1948 National Safety Congress**

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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

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The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE MARINE SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Marine Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Marine Section carries on in behalf of its members, and for the benefit of accident prevention work in marine transportation generally. The Section gives guidance in the preparation of a great variety of technical and educational materials useful in the day-to-day safety programs in shipyards and on ships. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on pages 34 and 35 of this volume.



## Physical Accidents to Personnel Incurred In the Construction or Repair of Ships

By HERMAN J. NORDSTROM
Safety Department, Newport News Shipbuilding & Dry Dock Company, Newport News, Va.

During the last war a large convoy was steaming toward its objective during a period of pleasant and calm weather. The monotony began to wear on the nerves of the closely congested army passengers. One day a soldier fell overboard with all the attendant confusion and excitement which did relieve monotony. Another soldier fell overboard on the following day. The enraged admiral in charge of the convoy immediately issued an order to all ships which stated: "No one will fall overboard during the remainder of this voyage" and no one did!

Unfortunately regulations cannot be executed to this nicety in industry. However, if the spirit of the regulations is understood, they will receive the same strict observance. Getting the spirit of them understood is the exciting challenge to the safety department. With this in mind, the careful investigation of "actual" physical accidents" not only gives us a lever for improving present methods and equipment but gives an opportunity for illustrating the purpose of safe practice regulations.

With these considerations in mind, I will speak about understanding the spirit of our "safety regulations governing repairs on tankers used for transporting flammable and explosive fuels and on vessels using oil as fuel." The purpose of these regulations is to control the gases encountered in ship repair; namely those presenting an explosive hazard, a fire hazard and a toxic hazard. At one time or another we must deal with all of these. I would like to consider these rules primarily from the point of view of controlling an extremely hazardous situation such as a gasoline tanker. Realizing that half a teacup of gasoline can generate 50 cubic feet of explosive vapor which can easily wreck by explosion a 50 foot boat, the importance of complete regulation is very apparent.

A very proper question might be, "How can a gas tanker suffer an explosion if it arrives in the repair yard in 'Safe for men and safe for fire' condition?" As the compartments designated by the certificate and those adjacent thereto are "safe for men," we know that any gases in the atmosphere are within the permissible limits. Furthermore, these compartments are "safe for fire," which informs us there is no residue in them capable of producing dangerous gases under atmospheric conditions or in the presence of fire.

It is true that this gas tanker remains "safe for men and safe for fire," provided that nothing is done to alter its condition. But the ship has been brought to the shipyard for repairs that will probably cause alterations, anyone of which may be the source of regenerative gases.

A gas tanker is a very complex structure containing many tanks and a mass of complicated and intricate piping systems. Unless every pipe line has been broken and every valve opened, pockets of gas are lodged within voids, pipes and bonnets of the valves.

An interesting illustration of the extent of the penetration of gas is the alarming explosive puffs that accompany burning out of rivets along the lap seam of the shell of a gas tanker. Additional sources of hazards are encountered with such tools and equipment as burning torches, propane lines, oxygen lines, blow torches, lead pots and gasoline heating pots all of which could cause untold disaster if they leaked. Accidents on gas tankers involving these sources are caused by situations that arise which are not contemplated nor expected.

In view of the above, certain precautions in addition to the Coast Guard and insurance requirements are necessary for governing repairs to vessels. In our mind, these regulations are considered to be a source of information when clearly understood. We feel this is just plain common sense. If a man knows that his negligence will result in his immediate death or in-



jury, his reasoning will prevent him from doing it. On the other hand if it appears that it may not happen, he very possibly will take that chance. Fortunately the percentage of individuals who have this frame of mind is low. This being the case, the percentage of people who can be expected to react to knowledge is high. Therefore, if the proper information is presented and understood, few accidents will follow.

This fact is well illustrated by a recent violent explosion aboard a fast twin-screw motorboat which painfully injured seven men while the boat was packing into its *berth* at a pier, following a *trip of several* hours duration. The boat fully conformed to all requirements and was equipped with forced ventilation equipment.

Investigation disclosed that the operator had noticed gasoline fumes during the day. In fact he opened the hatch over the engine space and gave it a cursory inspection to determine the source of fumes. As nothing appeared amiss, the hatch was closed because he felt that the fumes must have come from an adjacent refinery or tanker. In justice to the operator it should be made clear that he was a careful individual who handled the boat in absolute conformity with the officially recommended practices for safe operating.

The specific recommendations for the use of mechanical ventilation equipment are as follows: "As the majority of explosions occur when the starter is operated, before the carburetor air intake has had an opportunity to do its unknown share of removing the petroleum vapors from the bilge, it is strongly recommended, in the interest of safety, that the fan be operated at least five minutes before starting and after stopping the engine. Lighting matches or stoves, operating electrical devices or performing any other acts which may produce a source of vapor ignition should be avoided until after the vessel is thoroughly aired out."

I feel this is a good example of a case where the purpose of the rules of good practice are not understood. The people for whom regulations and rules of good practice are written cannot be expected to read a regulation with the pertinent facts spread around and think of all details as a unit.

The fact that there were vapors in the boat is known as a result of the explosion and statement of the operator that he had smelled gasoline fumes aboard. The boat did not explode prior to backing, because the operator had used his mechanical ventilators before starting and the natural draft was sufficient while under way. The boat was without ventilation at the time of the explosion as the mechanical blower was not on, and the natural draft system was ineffective. Thereby the explosive vapors were enabled to build up to their lower explosive limits.

Admittedly regulations cannot be written to cover every conceivable situation, but this brings us back to the point that the placing of a set of regulations in the hands of those concerned is not sufficient, because they must understand the full purpose and ramifications of the regulations. However, in this case, an ideal regulation might state that "mechanical ventilation shall be in operation at any time people are aboard and the motor boat is not under way," provided the term "under way" is understood. *In our case we must know that our employees understand fully the mechanical reasons for regulations, so that they will know what to do in the event of any unusual occurrence not specifically covered.*

Recently we reappraised our regulations governing work on tankers and on vessels using oil as fuel to be certain that they met with insurance requirements and went beyond them where we felt it necessary in order to conform with our basic philosophy as to what regulations shall be.

The regulations begin with a common sense statement indicating the purpose of the regulations, which is to aid examination of the ship by a certified chemist. For example, if a gas tanker, the ship will be examined before it comes to the pier. Furthermore, a gas tanker would be boarded from a launch and not from a steam tug.

This section reads as follows: "The ship repair section will, whenever practicable, ascertain the nature of the cargo of tankers before their arrival at the yard and on receipt of this information will advise the senior staff supervisor assigned to repair work and the certified chemist." The shipyard, incidentally, has employed its own full-time chemist, certified by the American Bureau of Shipping, since 1922.



Following in the regulations is a section on gas-freeing and cleaning tankers prior to docking which is a summary of the salient points of the Coast Guard and insurance company requirements. This section is incorporated in our regulations to emphasize to the ship owner how the ship is expected to be prepared before it enters the shipyard.

The general regulations governing the gas-freeing and cleaning of tanks and other restrictions covering repair work on tankers and oil burning vessels follow the first of which relates to gas-freeing. Because there are times when people must be made to do what they should do, this statement is made to give the chemist backing when he finds certain additional cleaning is necessary because regenerated gas may have been found.

This regulation reads: "When a vessel having previously been gas freed or otherwise accepted at the yard for repairs and upon examination by the chemist found to contain gas due to regeneration or other causes, the tanks or compartments containing the gas shall be steamed and/or cleaned as directed by the chemist until free of gas."

A very important section follows relative to danger marking. This regulation resulted from an error where a burner who was burning out rivets went over a boundary line into a bunker tank. His excuse was that he didn't know where to stop because there was no mark. The following regulation resulted from this experience:

"(a) *Vessels carrying oil in bulk as cargo (tankers):*

Before any work requiring the use of welding, burning, riveting, or open flames is undertaken, a band of blue paint shall be applied to outside shell and deck of the vessel, one frame space forward and aft of any compartment containing flammable or explosive fuel. No work shall be permitted in this area except under direct supervision of the certified chemist."

"(b) *Other vessels using oil as fuel:*

When work requiring the use of welding, burning, riveting, or open flames is required on the exterior hull of this type of vessel, any tanks or innerbottoms containing fuel oil or cargo oil in the vicinity of such hot work operations shall have a band of blue paint applied one frame space forward and aft of their boundaries." It is interesting to note that the color of this important band was originally yellow because of its high visibility. However, with the advent of zinc chromatic metal primer, a yellow paint by nature of its formulation, the color had to be changed and precaution blue was selected.

A section specifying the danger marking within the compartments of such vessels was incorporated as the result of a mistake by a fitter who was cutting out a portion of a deck in order to make a patch. While doing this he cut 3" into a fuel oil bunker tank. His excuse was that because the marks on the deck had been worn off by traffic he did not know precisely where to stop.

Although no explosion resulted, the mistake was costly because the oil had to be transferred, the tank cleaned, gas freed, tested, repaired and then filled again.

This section reads as follows: "When work requiring the use of welding, burning, riveting, or open flames is required within the compartments of such vessels, the surfaces of any tanks or innerbottoms containing combustible liquids in the vicinity of such hot work shall be marked by suitable signs. Posting and maintenance of such signs shall be the joint responsibility of the certified chemist and the plant protection engineer."

A section controlling cleaning was specifically included so as to keep employees from working until they have received permits from the chemist. It was felt that this emphasis was necessary because some employees doing cleaning work had the feeling that work of their kind was not subject to work permits.

It might be mentioned at this point that a system requiring the use of what we term "work permits" was instituted at the yard some twenty-six years ago, when because of the primitive tests that were then in general use, it was decided to take over a job of gas-testing and to put it on a more scientific basis. How this system functions will be discussed later.

Getting back to the work of the cleaning section, that portion of the regulations concerning this work reads as follows: "When the vessel has been certified free of gas,



individual cold work permits shall be obtained by the foreman, quarterman, or other shipyard employee in direct charge of the cleaners, permitting them to enter the compartments of the vessel for the purpose of cleaning and removing all refuse material."

Again a statement supporting the certified chemist was inserted as follows: "A check on the compartments shall be maintained by the chemist for gases formed by regeneration during the process of cleaning." In order to emphasize the close control necessary over employees doing this work, this section closes with the following statement: "It is particularly important that the safety rule providing for the safety of persons working in isolated compartments be rigidly enforced on this class of work."

In order to retain complete control over operations which may cause changed conditions, the following specific section relative to the re-examination of tanks was included: "Upon completion of the cleaning process and entire removal from the deck and vessel of this refuse material, the chemist shall again test the compartments for gas. If still gaseous, they shall be steamed and vented until free."

In this section "refuse material" is specifically mentioned because instances had been encountered where there had been an attempt to get certain work done before this material, which was a regenerative gas risk, had been removed. Such a regulation again enforces proper practice and helps clarify the reasons for such regulations.

The dangers of working in various compartments covered by official regulations are emphasized as follows: "Except where special authority is given by the certified chemist, together with a proper gas free certificate, no repairs necessitating the use of fires or spark producing equipment shall be undertaken in any compartment until all adjacent compartments are free of flammable or explosive gases."

Work that is done in areas considered dangerous is controlled by the certified chemist by the issuance of "work permits." A copy of each work permit is retained by and must be in the hands of the chemist, watchman and supervisor of the job before any work can be done.

The section governing tankers is as follows: "Under no circumstances shall any foreman, quarterman, or other shipyard employee begin his duties on or in any compartment of a tanker without a written permit from the chemist." These regulations relative to vessels other than tankers had to be written in a manner that would properly inform an employee and at the same time make him responsible to the chemist while using his own judgment.

These regulations read as follows: "Any welding, burning, riveting, or any other work requiring the use of open flame shall not be undertaken within or on the boundaries of tanks or compartments that contain or have contained liquid fuel or liquid cargo, or within the confines of any other compartment that by reason of its contents presents an explosive or fire hazard, without a written permit from the certified chemist." An illustration of the purpose of this regulation might be a situation where a man is doing hot work in a compartment. Anyone desiring to break a pipe in this compartment at this time would not be given a permit to work by the chemist.

In accordance with our feeling that regulations should be considered a source of information when properly understood, the following arrangements are felt necessary in order to prevent the promiscuous use of untrained personnel who could not recognize dangerous situations: "On all vessels undergoing repairs or alterations, and on all ships under construction which have reached a stage of completion where fire or explosion hazards exist because of the presence of fuel oil, other flammable liquids, or extensive combustible installations, welding and burning shall be performed only by welding department personnel or by welders, tack welders, or burners who have been specifically trained and are certified for work where such hazardous conditions may exist."

"When welding or burning in compartments or on surfaces that do not require a written permit from the certified chemist, it is the responsibility of the supervisor of the employee doing the hot work to ascertain if the work can be performed with safety. If in doubt, he should consult the certified chemist."

These regulations resulted from an explosion that happened some time ago within a dry dock gate that was being repaired. The interior of the gate was sprayed out one morning with a protective coating that set to a heavy grease. In the afternoon following the spraying, hot work was resumed after the supervisor had asked a gas tester some questions about the situation.

While the welder was welding a doubler plate to a platform, the coating under it became ignited and fell into the bottom of the dock where patches of the greasy coating caught fire and burned. The experienced men in the lower section immediately became alarmed and climbed out advising the welder and another employee on the platform of possible danger. Everyone except the welder left the gate at this time. During this period the heat of the fire was raising the temperature of the area which in turn vaporized the vehicle from the protective coating that had been sprayed on.

Suddenly there was an explosion which caused no structural damage and did not burn anything inside, but which blew the welder and another man, who had gone into the gate with a fire extinguisher, out of the gate. Neither man was killed directly by the explosion but rather by the fall into the dry dock. Evidently both men were on the ladder at the time of the explosion because they would not have been blown out otherwise. Furthermore, if they had remained in the gate they would not have been killed and probably not injured.

The accident illustrates that the experienced employees in the lower section of the gate were sufficiently informed to recognize a situation potentially dangerous. Although a gas test for explosive vapors would not have indicated any at this time, they were aware of the dangers of regenerated gases. Although the welder had been warned, it is possible that the warning was not heard. Furthermore, welders probably become accustomed to employees occasionally placing a hand on them for balance. In view of the assumptions, it is possible to say that this welder may also be an illustration of one sufficiently informed to recognize dangers because he evidently was ascending the ladder at the time of the explosion—perhaps because he may have suddenly become aware that no one was in the gate.



It is essential that the supervisor be held responsible because men under him are at all times entitled to feel that conditions are safe where they are placed to work, provided they do not break a rule. Furthermore, the supervisor is specifically directed to have work authorized by the proper authority—the certified chemist. In the case of the dry dock gate, the supervisor did make an inquiry,—but this was made of the gas tester who may have given an unimaginative answer to a brief question.

In order to emphasize control of work in areas considered dangerous, a specific section about work permits for repairs to pipe lines is included in the regulations. This constitutes a regulation within a regulation about work permits, which in this case specifies what pipes shall be broken, how they shall be broken, the manner of blanking the break, and when this work can be done. This regulation is as follows:

"(a) *Vessels carrying oil in bulk as cargo (tankers):*

No repairs or alterations of any kind to any pipe lines on a tanker shall be undertaken without a written permit from the chemist. The directions of the permit must be followed precisely."

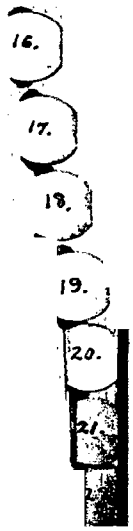
"(b) *Other vessels using oil as fuel:*

No repairs or alterations of any kind shall be undertaken to pipe lines connected to or passing through tanks containing flammable or combustible liquids, without a written permit from the chemist. The directions of the permit must be followed precisely."

The scope of the regulation on surface coatings was broadened as a result of the gate explosion in an endeavor to make the purpose of it even more explicit. Flexibility was retained by giving the chemist authority to control its application.

This section reads as follows: "Whenever hot work is to be performed within a compartment or on the surface of a compartment that has been coated with a combustible preservative material such as those with a bituminous or petroleum base, the area requiring the hot work must be cleaned to bare metal before heating is begun, unless otherwise approved by the chemist in writing."

The Coast Guard regulation covering the removal of ballast is emphasized and



a qualifying statement included to exercise this control also over dry docks and building docks as follows: "The pumping of oil or ballast containing oil from any ship to overboard while at the piers is positively forbidden."

"The pumping or drainage of oil or ballast from ships' tanks into dry docks or building docks is forbidden, except by written permit of the certified chemist."

The section on dry docks resulted from an explosion that occurred during the rushed repair of an empty tanker. The owners and the yard supervisors were anxious to get the work under way. Permission to proceed with the work was denied until the ship could be made gas free. Among the repairs was some work to be done to the rudder. Permission was granted to go ahead with this work, in the presence of the chemist, after it was established that the dock was gas free.

In the meantime the captain of the vessel had obtained permission from the dock master to pump water from his ballast tanks into the dock. As this mixture of gasoline and water flowed along the bottom of the dock, the gas vapors settled wherever it was possible to collect. As soon as the gas was of sufficient concentration, a spark set off a series of explosions that ripped up the planking in the bottom of the dock and set fire to the grating. Fortunately, no one was injured. Again trouble results from an employee's lack of knowledge of the dangers around him.

Work permit control by the chemist is again emphasized and elaborated upon by the following section on pump rooms: "Opening pipe lines or cargo pumps in pump rooms is forbidden except when under direct supervision of the chemist."

While making repairs to built up rudders certain common hazards become apparent. A minor explosion occurred in one rudder that was believed to have been caused by laying a leaking torch on the rudder when not in use. The torch also might have been repeatedly lighted over the rudder and in such a manner made it greasy. Practices such as these made instructions necessary throughout the entire plant.

The need for complete control was further illustrated when explosive mixtures were found in such locations as within the hollow pipe at the leading edge of a built up rudder undergoing repairs and in the hollow pillar within a gasoline tank on an aircraft carrier. The resulting regulation follows: "Welding, burning, riveting, and all other work requiring open flames shall not be performed on structural voids, such as hollow rudders, skegs, bilge keels, fair waters, without a written permit from the certified chemist. The instructions of the permit are to be followed precisely."

The following regulations are examples of planning to eliminate a source of potential accidents: "All temporary light wiring and welding wiring shall be maintained in perfect condition as regards insulation and connections, and every precaution shall be taken in handling such wiring to prevent arcing. Portable lights shall be protected by suitable approved guards."

"No one shall be allowed to enter any tank or compartment which has been closed for a considerable period of time until such space has been properly ventilated or tested and approved by the certified chemist."

As the result of the dry dock gate explosion and because incidents were arising during the rush of repair work where painters were working in machinery spaces while welders working overhead were dropping hot metal that started little flash fires on the paint below, the following regulation was adopted: "The use of flammable solvents and spray painting is prohibited in any compartment in which welding or burning operations are in progress except by written permit from the certified chemist."

The section that makes clear the important function of the watchmen in the work permit system and to insure the functioning of the system by having at least one watchman on duty is as follows:

"The amount and character of watch service necessary to insure the safety of individual tankers shall be determined by the plant protection engineer, who will be guided by information concerning the nature of the ship's cargo and the chemist's reports on the condition of tanks and other spaces. However, at least one watchman shall be assigned to each tanker for each workshift in which repair operations are under way."

"The watchman on duty on such aforementioned vessels will receive a copy of each working permit issued on the vessel. In the case of tankers, his duties shall be to ascertain if a permit has been issued for all spaces in which work is going on and stop work which he considers dangerous until the chemist has been consulted. He shall also be on the alert to detect incipient fires in spaces where hot work is under way and shall have suitable equipment at hand to extinguish them."

"In cases where vessels have their tank compartments sealed with live steam in lieu of gas freeing, the watchman shall watch the tank compartments and see that they remain under steam pressure at all times. He shall prohibit smoking by shipyard employees in all parts of the vessel, and by the crew of the vessel except in their quarters."

"The need of the following regulations is self evident: 'The necessary fire equipment of the proper type shall be placed on the vessel and properly distributed before repairs are undertaken.'

"Any interpretation of the above rules which may affect the safety of either vessel or workmen shall be left to the judgment of the certified chemist, and such additional regulations as may be found necessary from time to time to further the interests of safety will be added to the foregoing. In the event of a difference of opinion arising as to the proper procedure in any individual case, the matter should be referred promptly to the cognizant superintendent for decision."

"Strict observance of these rules is required at all times, and any infraction by an employee of the company will be considered sufficient cause for discharge."



Following a disastrous fire some years ago, certain regulations were adopted to restrict the use of equipment capable of producing explosive gases. All such equipment as gasoline blow torches, plumbers torches, propane burning torches and hose, and heating torches, is assigned a serial number for record purposes and is subject to a thorough inspection every two months at which time it is dated in letters about 3 inches high. The regulation also states that "it is the duty of all supervisors and watchmen to observe torches in use to see that these rules are strictly enforced."

General use of flammable paint and varnish removers is no longer permitted within the shipyard. In this connection, it is interesting to note that during the reconversion some time ago of a large North Atlantic passenger liner, it was necessary to use flammable solvents to remove certain coatings. In accordance with our regulation, this work was properly done under the direct supervision of the chemist. A ventilation system was arranged and combustible gas tests were continually made during the use of the solvent.

These regulations place the supervisor responsible to the chemist for all work throughout the shipyard. This method keeps the work under control, develops a cautious attitude among employees and gives them an opportunity to learn the reason for the regulations. The regulations are flexible because work can be done in any way that is agreeable with the certified chemist. We feel the effectiveness of this system for controlling combustible vapors is illustrated by the fact there have been no explosions aboard ship in the 26 years of its use.

## Asphyxiation Cases in Shipyards and on Board Ships Under Construction or Repair

By I. C. YATES
Director of Safety, Alabama Drydock and Shipbuilding Co., Mobile, Ala.

The word asphyxiation contributes very little to the serious, every-day thinking of the average rank and file workman, but when the word itself is simplified to "the stoppage or interruption of breathing," the thought and seriousness of the hazard has been properly conveyed.

There are certain hazardous conditions

aboard ship that are possibly so accepted, because they are assumed to be merely a part of the operation and are nothing to become excited about. After carefully analyzing the performance or operation; it may be found to be an unsafe practice rather than a condition, and that something can be done about it. Man failure is often overlooked in favor of conditions, because it is naturally easier to follow the lines of least resistance rather than absorb responsibility.

In previous conferences and sessions, we have discussed accident control from which we have possibly realized some benefit. It is well to review actual cases, when and where possible, which perhaps will bring to us the particular accidents, actually as they are.

It is with this thought in mind that we attempt to discuss these actual happenings as they were, or as they have been conveyed by those who knew about them. It is well to keep in mind that these related experiences may or may not be exactly in detail, but they do reveal generally, the cause of the accident, the corrective measures and placing the responsibility. The efforts put forth herein are in the interest of human life, and we must dedicate ourselves toward that obtainable goal in safety engineering.

Chief among the hazards involving asphyxiation, in shipyards and aboard ships under construction or repair, are areas that are deficient in oxygen, due to having been confined for long periods. This being the cause of the loss of life to two ship repairmen in particular.

A Liberty ship had been moved from a lay-up fleet base into a shipyard for repairs, in order to put the ship in service. It was necessary to open up hatches, manholes and so forth, in order to gain access to certain tanks and other confined area involved. This particular operation involved the forward deep tanks. Workmen were assigned to remove manhole plates from all four deep tank compartments, with positive instructions from their supervisor, not to attempt to enter the area until tests were made, and necessary ventilation had been completed.

The workmen removed the manhole plates, and before ventilation equipment had been installed, the mechanic being over anxious to complete his job, entered the No. 1 starboard tank without oxygen mask equipment, leaving his helper at the manhole on the tank top.

While descending the ladder he collapsed, and fell to the bottom of the tank, a distance of only about two or three feet. The helper became excited, and went into the tank (without protective equipment) in an attempt to rescue his fellow workman, and he too collapsed just as he reached the bottom of the ladder. Another workman sounded the alarm and rescue workers removed the victims, and started resuscitation immediately, which did not prove successful.

In order to prevent recurrence of such accidents it is necessary to (1) require supervisors to personally oversee extremely hazardous jobs, until the point of danger is past. (2) Supervisors to conduct daily "shape up" or "tool box" safety talks with all the employees under his supervision, before starting work. (3) Safety and First Aid training to employees will help greatly in making them aware of hazardous practices and conditions and will tend to make them much better workmen. (4) Testing, inspection and ventilation of all confined areas are most essential, but these methods in no way help to control human behavior.

Although the supervisor had previously instructed his employees regarding the installation of necessary ventilation before entering the area, he should have realized the seriousness of the situation, and personally supervised the job until the danger period passed.

Supervisory passing of the hard and fast rules of any organization on to his employees, as a part of routine duty, is not enough. The supervisor must definitely have the care and well-being of his employee at heart, and be willing to go beyond the call of duty to insure their personal safety.

After careful consideration and analization of all points involved, it is evident that the responsibility should be charged as supervisory neglect.

Similar instances where workmen have lost their lives, due to deficiency of oxygen, are prevalent aboard ships that have been carrying grain cargoes. Take the case of a repairman going into a confined area aboard a grain carrying cargo ship on instructions from his supervisor, to make minor repairs. The job being of minor nature, the workman did not think it necessary to install ventilation equipment for the short period. The supervisor failed to survey the area and determine the need. The workman had been in the area alone for only a short time, when fortunately a fellow workman came to assist him. Upon his arrival he found this workman had passed out. He immediately removed him from the area, into open air, and started artificial resuscitation. The victim responded quickly to first aid treatment.



Corrective measures are:

(1) Supervisor survey the work area and determine the needs. (2) Installation of ventilation for a sufficient time before allowing workmen in the area.

Responsibility in this case must be placed and the supervisor, for assigning workmen to a job without knowing himself what the existing conditions actually were.

Brush and spray painting are hazardous operations in closed or confined areas. This particular job was being performed in a water tank aboard ship.

The paint crew of six men were assigned to do the job. The supervisor issued what he thought to be suitable respirators to each workman, and instructed them to work inside in two shifts of three men to each shift for a period of thirty minutes each. A ventilation blower was installed at the manhole, blowing air into the tank. After approximately three hours work, the job was completed, and the last three man crew was ready to come out. Two of the men came out, and did not notice that the third man had not as yet come out of the tank. The alert foreman inquired of the third man, and not being able to locate him on the outside, went inside the tank and found that the man had been overcome by fumes and had passed out. The workman was removed and revived.

It was discovered that the ventilation mechanic had installed the blower to force air into the tank; instead of exhausting the paint fumes from it.

Ship fumigation is a very serious hazard if not properly and systematically handled. Hydrocyanic gas is used to a large extent and failure to take proper precaution was responsible for the death of a ship repairman. This particular ship was fumigated and this workman did not wait the required time before going aboard.

It is very necessary that strict precaution be taken in fumigation. (1) Bulletins or written notices should be posted and circulated to the effect, at least 24 hours prior to the fumigation period. (2) Warning signs should be placed at the head of gangways or ramps. (3) A watchman should be posted to keep all persons off. (4) A thorough check and test should be made immediately following the fumigation, to determine if the conditions are safe before anyone is allowed aboard. Responsibility for such failure must be placed on top supervision.

It has been said that ignorance excuses no one, but, nevertheless, a large number of persons seek the lines of least resistance, and get over into the commonly called "rut of laziness," or shall we say, inattention to duty.

A ship repairman and his helper were delegated to perform certain duties in a very close or confined area aboard ship. After having arrived at the point of work, the mechanic instructed the helper (who was a new employee) to secure an air hose, and run line from the manifold on the main deck to the job, where it would be used to propel a pneumatic tool. The helper secured the hose and made the connection, and ran the hose into the area where the work was being performed.

The helper, being inexperienced, made the hose connection to a gas manifold instead of compressed air. After some time, both workmen were found having been overcome by the gas. Both workmen's lives were lost due to negligence on the part of the repairman.

This accident could have been prevented if (1) the mechanic had made the hose connection himself, or properly instructed the inexperienced helper in the correct manner of making it. (2) Fittings of different types should be used on oxygen, acetylene, and air manifolds, making it impossible to make the wrong connection. (3) Standard color code, for marking manifolds or outlets, should have been used



(4) Very close supervision and training of inexperienced or new employees is very necessary.

Exhaust fumes from internal combustion engines have proven fatal in many instances. The installation of a small gasoline engine, in a confined area aboard ship, to propel a pump, resulted in the death of a repairman's helper. The engine was started and after seeing that the operation was going satisfactory, both workmen, after some time, went above onto the open deck. After a lapse of time, the repairman instructed the helper to go below and see if everything was operating all right.

The helper did as he was instructed, and after he had been gone for sometime, the repairman became curious as to why he had not returned. Upon investigation, the helper was found near the engine, where he had fallen, having been asphyxiated by exhaust fumes from the engine.

(1) Internal combustion engines should never be installed or allowed to exhaust in a confined or semi-confined area.

(2) Proper supervision is necessary to insure proper methods and equipment.

(3) Safety training for all employees.

It is the opinion that supervisory failure was responsible for the accident.

Equipment used for protection if not properly used, sometimes result in serious accidents. Carbon dioxide gas is very effective in fire extinguishment and has proven successful in systems installed aboard ships. However, if it is not properly used, it can become as deadly and treacherous as it can be beneficial.

The conversion of a combat cargo ship was in progress, and as usual, considerable changes and alterations were being made. Possibly twenty or twenty-five laborers were being used on cleaning work in a closed area in No. 3 hold. The ships carbon dioxide gas system was accidently released into the No. 3 hold, where this particular group of men were working. Approximately fourteen of these men were asphyxiated, of which nine of them were revived by resuscitation methods.

The carbon dioxide system aboard this ship was manually controlled, and it was evident that in the process of tearing out and rearrangement operation, the release cable was accidently hit or pulled thereby releasing the gas into this particular compartment. To avoid *similar* accidents it is suggested, that during the conversion or extensive repair period, the carbon dioxide gas system be *secured at the source*, and that necessary ventilation of all confined or congested areas be carried out.

Placing responsibility in this particular accident requires most serious and careful consideration, but it possibly would be regarded as a top supervision responsibility.

The use of carbon tetrachloride as a cleaning agent is not recommended, especially in a confined or semi-confined area. Neither is it advisable to use this vaporizing liquid in fire extinguishment in closed or confined space, without the proper protective mask equipment.

On one occasion in a semi-confined space aboard a ship under repair, an electric motor caught fire. A workman standing near, secured a carbon tetrachloride extinguisher and directed it on the hot motor. Being directly above or over the motor, the workman was soon overcome by the fumes. A fellow workman came to the rescue of the victim, and first aid was administered with favorable results.

Continuous training in the use of fire fighting equipment is very essential in the safety training program. The workman himself was responsible in this particular case, as he had previously received training regarding the use and the handling of this type of equipment and deliberately exposed himself by chance taking.

The hazards involving asphyxiation in ship repair and conversion work and aboard ship are most serious and require extensive continuous effort and training in order to effectively control it.

The average workman has a fear of personal *injury*, especially from such operations as are involved in the use of the flame torch, circular saw, or the moving parts of machinery, because the hazard itself from a mechanical point of view can be seen. The majority of our workmen, as a rule, do not see or realize the hazards involving asphyxiation, therefore they do not realize or have the necessary respect that should exist. We definitely must not, by any means, neglect safety training that is so necessary in industry.



# Fires and Explosions Occurring in Shipbuilding and Repair Yards and on Board Ships Under Construction or Repair

By CAPTAIN B. LEE ROGERS
Plant Protection, The Maryland Drydock Company, Baltimore, Md.

*Fire*—a tough monster to fight after it gets it first bite. Food for this monster is always present and as soon as we let one barrier down the monster eats lives, material, ships, warehouses, production, and dollars.

It has been my practice to follow three rules:—

1. Remove the hazard, or set up fire prevention measures when the hazard cannot be moved.
2. Provide (and know that they are in first class condition by constant inspection) fire extinguishing agents necessary to control fire when it starts.
3. Instruct and drill personnel to control and fight fires aboard ships.

*What is on the other side of the bulkhead or deck?* That is, the question every *supervisor*, burner, or welder should ask before any hot work is started. If you want to prevent fires and explosion, you must know what is on the other side and I cannot emphasize that too strongly. I will try to point out what I mean.

A conversion job is just about completed. All work aft is declared complete. Stores are brought aboard and stowed. While making an inspection of the ship, a supervisor sees a piece of pipe welded to a bulkhead. This pipe should have been burned off many days previous. The supervisor calls a burner and tells him to burn the pipe off.

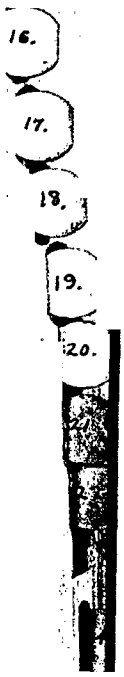
Without either man looking on the other side, the burner began to burn. The space on the other side is freshly painted and stored with supplies, paper, matches, mops, brooms, and general necessities. The paint catches fire, falls on the paper and matches, and the monster had his first bite. There is a considerable amount of damage and the ship is delayed.

*Look on the other side before you burn or weld.* A repair job was moving along without incident until one day a burner working with the pipefitters was burning pipe brackets off the passageway bulkhead. *From* the passageway there was a door leading to a supply room, the door was locked. Disregarding the locked door, and *with no* effort to determine what was on the other side, the burner continued to burn brackets. The contents again was mops, brooms, rags, electric fixtures, and what not. The alarm was sounded but in a few minutes the passageway was filled with smoke which retarded our efforts to reach the room, get the lock off and extinguish the fire. More damaged goods and many production hours were lost; the pipefitter and burner were discharged.

*Look on the other side.* A welder was sent to do a job at a pier away from the yard; to weld a clip on the afterpeak tank top. The tank was filled to within one foot of the top with oil. The welder started welding and there was a terrific explosion. Plates buckled, rivet heads flew off, and steel twisted like tin and the steering engine mechanism had to be replaced. The welder was not injured.

*Know what is on the other side.* Here is a case where two men were killed instantly. In a certain shipyard, two men were sent to weld on the tank top just aft of the midship house. The facts as to how the explosion occurred are not clear, but the results are. When the explosion took place, the aft bulkhead of the engine room was blown forward carrying with it gauges, valves, pipe and machinery turning the engine room into a rubble-heap, killing the night engineer and his assistant. It also blew a hole about seven feet square in the port side of the ship which caused the ship to settle to the bottom. Strange as it seems, neither of the workmen were injured.

*What was on the other side?* There are many other cases that I could use to emphasize how important it is to look on the other side before you burn or weld.



Plaster the sign boards in your plant with signs "Look before you burn or weld." Have meetings with supervisors. Insist that they impress upon all of their men to see what is on the other side before any hot work is done on a bulkhead or deck. Discharge supervisors and workmen who disobey the order and publicize your actions.

Acetylene tanks and oxygen bottles should not be taken into confined spaces or under decks, and I would like to give you a few reasons why.

An acetylene tank was ignited by a burner lighting his torch too near the tank. The flame was put out with $CO_2$. Another tank ignited from a backfire that had a regulator fixed in place. A $CO_2$ extinguished the flame but as the $CO_2$ gas cleared away the heat from the regulator reignited the gas and the tank was allowed to burn itself out.

*Explosion of oxygen cylinder aboard merchant vessel.* Shortly after starting time on the day shift, an acetylene burner attached his rig to fully charged acetylene and oxygen cylinders. The acetylene cylinder was standing in an upright position while the oxygen cylinder was on its side on the boat deck of a vessel. After connecting his rig to the cylinders, the burner tested for pressure and, satisfied that all was in order applied flame to the torch. The torch backfired and the acetylene hose split for a distance of several feet down from the cylinder connection but remained fast to the cylinder. In his excitement, the burner attempted to pull the hose off the acetylene cylinder but succeeded only in turning the cylinder over on its side in such a position that the bottom was exposed to the flame from the burning hose. The heat caused the fusible safety plugs to blow out and the acetylene gas escaped through the holes ignited. The flames from the burning acetylene played directly on the oxygen cylinder.

The wooden deck became ignited and a shipyard fireman, who was nearby, immediately began to wet down the deck with a charged hose line which was at hand. Several other workmen rushed to the scene and attempted to assist the firemen. The heated oxygen cylinder exploded; the bottom of the cylinder struck one of the workers in the abdomen causing his death. The concussion blew the fireman several feet into the air and over the side of the vessel onto the concrete pier to which the vessel was moored. He landed on his head and was dead when he was reached. Several other workmen sustained injuries of a less serious nature.

My experience has taught me that when an acetylene tank ignites, if it is out in the open where it belongs, leave it alone to burn itself out. Have a standby line available just in case a fire is started.

*Fire and damage caused by sparks falling through open port holes.* I will try to explain one case which in effect will cover all such cases. A burner was burning overhead from a stage board which had one end anchored in an open port hole. Sparks fell to the stage board, bounced through the open port hole onto a settee in an officer's room. The entire furnishings of the room were destroyed either by fire or water.

Regulation to the yard:

"NO HOT WORK OF ANY KIND IS TO BE DONE IN ANY AREA UNLESS ALL PORT HOLES ARE CLOSED."

A tanker on drydock had been declared safe for men and safe for fire. The day was hot and humid. Two stagebuilders had finished staging the tank and were getting ready to leave. A welder was working on deck near the tank opening. An eye witness stated that he saw sparks go into the tank just before he saw and heard the terrible explosion.

He ran to the tank where he found one man with his clothes on fire which he helped to extinguish; the other man had fallen to the bottom of the tank. One man received severe burns all over his body, and the other man was dead when taken from the tank. There was no fire after the explosion.

From past experience we know that workmen will report the presence of gas fumes in a tank. These stagebuilders had been in the tank for the greater part of a day with no complaint of gas fumes.

We feel that the explosion was caused by the spark igniting some gas in a rust pocket under the deck at the coaming which had been heated by the sun on the deck.

Suggestion: Recertify tanks more often during hot weather.



*Fire in air ducts aboard ship.* A welder was welding an air duct overhead. Sparks fell below and set the grease on fire behind the blower fan. Oil, grease and other combustible material had settled on the bottom of the duct and, according to the witnesses, there must have been quite an accumulation of combustible material in this duct to produce the amount of flames which caused damage so high above the fan. The hose lines used in flushing the duct, after the fire was out, also brought out a heavy oil film. The following order was issued to the yard:

In order to prevent outbreak of fire, similar to what recently happened, the following regulations have been set up in connection with performing hot work on vent systems, blowers, etc.:

"Prior to any hot work being performed on vent systems, blowers, etc., the yard fire department is to be contacted by the departmental supervisor who is to perform the work and the yard fire department is to dispatch a representative to the job, inspect conditions, and make recommendations as to the precautions to be taken and procedure to be followed before any hot work is performed."

It will be the duty of the supervisor of the department performing the work as well as the supervisor of the service department to see that the above regulation and recommendations of the yard fire department are carried out.

There is one fire hazard that we have been unable to cope with and that is crew members falling asleep in their bunks with lighted cigarettes and setting the mattress on fire. These fires are not too hard to control if we get to them soon after they start, but they can be very serious—especially to the guy on the bunk.

*Oil and debris on and in the water.* Don't let anyone tell you it won't burn. While burning a hole in the inboard side of a ship, a piece of hot plate fell and landed on a small oil soaked plank which was surrounded by oil and debris. The wood started burning. This heated the oil around it, and the oil and debris started burning.

Flames went up the side of the ship and burned some stage boards, air hose and welding cable. For the type of fire and its location, there was very little damage because it was quickly extinguished. The following memo was issued to the yard:

"No hot work of any kind is to be performed on any ship where sparks could land overboard, until the approval of the yard fire department has been obtained."

Two firemen on each shift have been detailed to patrol piers and drydocks. Members of the yard fire department have authority to stop at once any work where danger of fire from igniting oilslick is evident."

You can prevent fires by making regular inspections of your locker rooms and shops. We have found, on many occasions, that workmen put paint and oil covered clothes and rags in, under and on top of lockers. There you have the makings of a fire with the proper amount of heat. The fire will start with no one anywhere near it. Of course, if the building has automatic sprinklers, the alarm will be sounded and the damage can be kept to a minimum.

Wood fires in open drums during the winter months have caused many headaches and a few fires. Here is an example: Someone starts a fire in a drum; Joe comes along and throws a piece of wood in; Tom comes along and he tosses in a piece. By now we have a roaring fire, sparks flying.

A fire was started in a drum in a hold of a ship. A welder, pulling his hose out of the hold, upsets the drum. The fire from the drum started a trash tub to burn. There was no property damage, but fifty workmen knocked off to watch the fire burn.

Company rule:

"No open fires will be permitted on any ship or in any part of the yard except in connection with work in hand."

The fire damage figures never include the dollars lost in man hours while a fire is burning. When the alarm is sounded for a fire aboard ship, it could well disrupt the organization causing hundreds of man hours to be lost.

Let all of us remove the fire hazard, but have available first class fire fighting equipment; men trained to fight fire; keep preaching, harping, and bellyaching about fire prevention. We should be able to have fire prevention years instead of fire prevention weeks.

In all of our buildings we have the proper

type fire extinguishers, for the contents of the building, located at the entrance. I have actually seen fire extinguishers placed in buildings on the far side away from the entrance. You would have to go through the fire to get to the extinguisher.

Our fire extinguishers throughout the yard are discharged, cleaned, painted, recharged and tagged once a year, during the month of April. Each extinguisher is painted a different color so that you can tell what type it is from a distance.

Weekly inspections of fire fighting equipment are made throughout the yard and buildings by the fire department lieutenant. Follow up inspections are made periodically by me.

Aboard the average ship that comes to the yard, we put 450 feet of 1½ inch rubber lined canvas covered fire hose flaked on the rail; 150 feet of hose forward, 150 feet midship and 150 feet aft. We previously had 2½ inch fire hose aboard ships but found the 1½ inch hose much easier to handle and that it would control fire just as well.

We now have cans of liquid foam and aspirator nozzles in our hose houses near the water front available in case we have oil fires on the water. We also have fog heads, applicators and the all purpose nozzles in the hose houses for any emergency.

The 2½ inch hose on reels and in hose boxes is tested with shut-off nozzles at 100 pounds of pressure, inspected, cleaned and replaced twice a year.

## Shipboard Fire Control

By EDWARD J. KEHOE
Fire Prevention & Safety Engineer, U. S. Atomic Energy Commission, New York, N. Y.

The captain of a ship at sea, in addition to his many other duties, is actually his own fire chief. This responsibility is thrust upon him regardless of the extent to which he realizes it. The complete meaning of "being your own fire chief" may not be evident until a fire starts. It is too late then to be concerned about the maintenance of fire fighting equipment; it is too late to be concerned about the fire drills that you did not have, or worse, those that you did have and which resemble comic operas rather than a real attack on your enemy—fire.

Prior to the war, not very much was known about handling ship fires. That lack of knowledge was by no means confined to the sea captains; the fire chiefs of our port cities have established a rather miserable record in the handling of ship fires. Such a fire is a particular type of fire which is generally not encountered very often by the municipal fire chief. It is also a fire which requires different tactics as compared to the procedure used in fighting land fires.

The ship captain at sea, who as I have said is his own fire chief, has to fight his fire with the forces at hand and invariably has no outside assistance within a reasonable distance to call on. The municipal fire chief on the contrary is frequently in a position to call in almost unlimited amounts of fire apparatus and personnel. I understand that over 80 pieces of fire apparatus were called to the Pier 57 fire in New York City last year. We might therefore expect that the record of ship fires would list many calamities at sea and yet when the record during recent years is examined, we find that many of the conflagrations have occurred in port, as witness the ERICSSON, MONARCH OF BERMUDA, GRAND-CAMP and HONDURAS VICTORY.

The general matter of shipboard fire fighting received a tremendous impetus during the war when fire became such a potent weapon of destruction. The Navy did much to solve the problem of fires on combat vessels. As a result of the Navy's work, much was learned about fighting ship fires involving flammable liquids such as oil and gasoline. The Coast Guard in its PHOBUS tests ran extremely valuable experiments on cargo fires.

As I have said, both the municipal fire chiefs of our port cities and our sea captains are concerned with shipboard fire control. However, since this is a marine group, let us concentrate on our phase of the problem and consider just what can be done by our ship captain who is confronted right now with the problem of licking a fire at sea with the equipment he now has aboard.



The captain must begin with his ship exactly as it is constructed and exactly as it is presently equipped for fire. The initial step is to analyze the ship thoroughly from the viewpoint of fire. The capacity of the fire pumps must be studied. A crew which is not well trained may attempt to operate too many fire lines in their excitement, thereby exceeding the capacity of the pumps and resulting in ineffective streams. The ventilating system must be studied. Ventilating ducts become dirty and, if not cleaned periodically, enable the fire to spread quickly throughout the entire ship. The blowers to an air conditioning system will blow smoke throughout the ship if not turned off promptly at the time of the fire.

The problem of disposal of the water used on the fire must be studied. Reasonable stability has to be maintained and free water avoided. One of the major advantages of fog nozzles in fighting ship fires is the reduction in the amount of water actually used, since the water used as fog is generally more efficient in extinguishing than the water applied as a solid stream.

Very many ship fires can be controlled, although usually not extinguished, by simply closing up, as completely as possible, the compartment where the fire is burning. All fires require three factors, namely: fuel, oxygen and ignition temperature, which may be compared to the legs of a triangle. Any time one or more of these factors is missing, the triangle collapses and the fire is out. Sealing off the compartment entirely cuts off the oxygen and eventually brings the fire under control after the oxygen in the air in the compartment has been consumed. This rule does not apply, however, to the few chemicals which contain their own oxygen in their chemical construction, such as most explosives.

Fire drills must be regularly held aboard ship and they must be realistic. To show what is meant by a realistic fire drill let us consider one ship I know of where such drills were far from realistic. On this particular ship, drills were regularly held. On such occasions hose lines were stretched and water was turned on and at certain points along the deck, nozzles were placed on the gunwhale and splendid streams of water were shot over the side. This procedure had been followed for years and was always most successful.

However, one day a motor whale boat on the deck caught fire. On sounding the alarm the regular drill procedure was resorted to. Again within a few minutes a half dozen 2½" streams of water were pouring over the side while the motor whale boat continued to burn away merrily on the deck! Our drills at sea must be a complete surprise. If a half a dozen or a dozen people know about the drill in advance, the feature of surprise, which is so devastating in the case of an actual fire, is completely lost. A different location should be chosen aboard the ship for each fire drill. The problem will vary from time to time depending upon the type of cargo being carried. Water may be the most desirable extinguishing agent to use for one particular type of cargo. On the next trip a stream of water shot into the holds may blow the ship apart.

It is impossible to lay down specific rules as to what is the best extinguishing agent or as to exactly what procedure is to be followed in all cases. Fire is a wily enemy and must be fought the same as any other enemy is fought. Your attack must be adaptable to the situation presented by the enemy. We want our shipboard fire fighters to have a general knowledge of the principles of fire fighting. They must know the advantages of the various extinguishing agents that they have aboard the ship and they must also know their limitations. Fires have many times been successfully fought at sea by a combination of various extinguishing agents and various techniques.

In looking over our record of ship fires, we are naturally somewhat pessimistic for the record appears to be a very tragic one. However, there are cases where magnificent results have been achieved at sea and in order to be fair, such cases must not be overlooked. During the war an ammunition ship collided with a gasoline tanker off Hatteras. The ammunition ship disappeared completely in the ensuing explosion and the gasoline tanker was set afire. The picture of a tanker loaded with gasoline and burning vigorously is certainly a terrifying spectacle. That fire was put out!

In fighting that fire the crew was assisted by a small group of shore-based fire fighters.

The men who gave the assistance were few in number, as a matter of fact, were far less than the number of fire fighters one gets in a port city by simply pulling the handle on the nearest fire alarm box and getting a first alarm response. However, the men who responded to the fire had two things. First of all, they had light portable equipment that had been thoroughly tested *beforehand in relation to the type of fire* that they had on the ship and secondly, they were highly trained in shipboard fire fighting. When I say highly trained, I mean that they had time and time again put out, in a training school, the same type of fire that they had at sea.

The whole problem of shipboard fires can be broken down in the last analysis to three things, sound construction, proper fire equipment and the trained men. Obviously, one without the others is inadequate. Our ships *at the present time are improving in* construction and fire equipment. It is most important that the training of our crews keep pace with the equipment as it is now, and as it is improved.

It is impossible for a crew at sea to obtain actual fire fighting training experience and *to lose their fear of fire regardless of* how realistic we make our drills. I do not mean to underestimate the importance of realistic drills at sea but obviously such drills cannot feature roaring fires. The only way the captain and his crew can lose their fear of fire and can learn the uses and limitations of their equipment under actual conditions is by fighting actual fires. Consequently, some type of training in port is necessary. It is unfortunate that such work must be undertaken in port but there is no other solution to the problem.

The Navy Fire Fighters' Schools did a magnificent job during the war. The Navy is presently operating a few of the schools although hampered by budgetary and personnel *limitations and has taken in small* quotas of personnel from some of the companies.

The problem of sending your crew to some sort of a fire school ashore during their few days in port is a little complicated when we consider that the training *may consist of your men repeatedly entering* a blazing simulated ship compartment laid out to exactly the same scale as the engine room on your ship and in which so terrific a fire is burning that flames are shooting 25 feet into the air from topside. It is not a very pleasant way to spend a day. However, in trying to look at the matter without favoring either management or labor, it seems to me that this can only be solved by joint action and cooperation, both management and labor having a vital interest in the matter. When a tough ship fire occurs at sea and a ship is lost with all hands, it is management who loses the ship and its cargo but it is labor who loses the lives!

In conclusion, I wish to mention that further investigatory work remains to be done with fire resistive paints and on the use of wetting agents and dry powder as extinguishing agents. Wet water is simply regular water treated with a chemical to increase its penetration and was not sufficiently advanced at the time of the PHOBUS experiments to be thoroughly tested. I understand that dry powder as an extinguishing agent has improved considerably and offers great promise.

We will now show a motion picture entitled "High Capacity Fog-Foam for Carrier Protection." Although not a standard Navy training film, it is a recording in color of some extremely valuable experiments conducted at the Naval Air Station at Edenton, North Carolina, towards the end of the war. The tests were a part of an intensive research program towards the development of a practical method of bringing gasoline fires in the hangar and flight decks of aircraft carriers under control more effectively and with greater rapidity. The latter problem of course became particularly urgent as a result of the Japanese kamikaze attacks. As you will see, many of the tests involved as many as 18 aircraft and as much as 2,500 gallons of gasoline. Obviously, tests of such magnitude can rarely be undertaken on account of the costs involved and it is therefore certainly desirable for all who are interested in shipboard fire fighting to have the opportunity to view the film. As a result of the effectiveness of high capacity fog-foam as indicated by the tests, our carriers are now being fitted out with such equipment.

(The views expressed in this paper are entirely my own and are not necessarily those of the Navy or the Atomic Energy Commission.)



# International Conference on Safety of Life at Sea

By ADMIRAL JOSEPH FARLEY
Commandant, U. S. Coast Guard, Washington, D. C.

We of the Coast Guard consider that the promotion of maritime safety is one of our most important duties. The recent International Conference on Safety of Life at Sea in London was an interesting example of the effort that is being made to reach higher standards by means of international action.

We work on the basis that, first, we want to prevent a casualty, second, if a casualty occurs we want to keep it from endangering the ship, and, third, if the ship is endangered we want to insure saving all her personnel. The provisions of the Safety Convention can all be classified as falling into three divisions: prevention, mitigation and rescue.

The 1948 Convention makes sound, but not sweeping, improvements to that of 1929 which is presently in effect. The 1929 Convention has stood the test of time, insofar as it goes, and our major effort was directed towards adding new requirements and perhaps bringing some of the old ones into closer accord with modern developments. As I am sure that you are all familiar with the present Convention, my remarks will be mainly limited to matters wherein the new proposals go beyond the old.

The requirement that passenger ships be tested for stability was extended to cargo ships so that masters may know how to avoid a top-heavy loading. The meteorological services to be rendered to ships at sea were broadened so as to give better warnings of dangerous storms. For the first time, a positive requirement was agreed to which places on nations the responsibility of maintaining adequate aids to navigation along their coasts.

The International Ice Patrol, which warns traffic away from iceberg regions is continued but with a more flexible basis for adjusting the costs of the service among the benefited nations. All these provisions, taken in conjunction with the regular surveys to make certain that each vessel is in safe and seaworthy condition, are aimed at preventing casualties in the first instance —in other words, to shut the barn door *before* the horse is stolen, not afterwards.

But it is recognized that casualties may occur, notwithstanding. Therefore the Convention continues the 1929 standard of subdivision for passenger ships, so that a vessel will remain afloat with one or more compartments flooded, and in addition requires that in such a flooded condition she must not experience an excessive list or heeling. Watertight doors in bulkheads and powerful pumps assist in controlling the flooding.

In case of fire, not only is the ship divided by fireproof bulkheads about every 130 feet but within those spaces additional divisions may be required or special sprinkler equipment fitted. The general provisions for fire extinguishing go considerably beyond the 1929 arrangements. The intent of all these requirements is to localize damage and to keep the ship afloat. We hold strongly to the view that the ship is her own best lifeboat.

However, even those measures may prove fallible and the master may have no alternative but to abandon. The Convention now provides for, first, the maximum possible rescue facilities at his own hand and, second, the maximum possible assistance by other vessels. Compulsory radio equipment, including a completely independent emergency set, permits sending calls for assistance. All ships hearing a distress call must proceed to the rescue unless they are too far away or are excused by other ships which are at the scene. An efficient line-throwing apparatus is required, and large passenger ships must have available special rescue boats.

The distressed vessel itself, in the meantime, may make use of her own lifesaving equipment. The boats, in the case of ocean-going ships, must accommodate all on board, with life rafts or buoyant apparatus in addition on passenger ships. The new provisions insure that at least one lifeboat on each ship, including cargo ships, shall be a motorboat and at least one shall be radio-equipped. New requirements as to

boat stowage and boat lowering devices should guarantee the safe lowering of all boats in emergency. In case a ship is stranded on a shore a new and simple system of signals between ship and a rescue party on shore is provided.

So much for what the new Convention provides. You know the old saying that the United States never lost a war or won a Conference. I think that this does not apply to the London meeting, because we were generally satisfied with the progress we were able to make. Nevertheless, in three directions we feel that there is room for further advances without unduly burdening any foreign shipping. One of these is the question of manning.

The Coast Guard believes that no mechanical gadget is any better than the men who operate it. As you know, we lay great stress on the number and caliber of maritime personnel and upon the importance of careful and frequent emergency drills. We had hoped more closely to approximate, internationally, the fire-proof standards of American ships. We had hoped to go further than we did on the subject of dangerous cargoes and cargo-handling gear. We did secure recommendations that further study be given to most of these subjects and we consider them as definitely "live" matters, particularly the subject of dangerous cargoes which demands unified action in the near future to avoid its being dealt with on a state or municipal basis, which would be chaotic.

The new Convention specifically exempts from its application vessels confined to the Great Lakes and of course river and inland craft are not affected. As a matter of fact, it will have little or no effect from a cost standpoint on our oceangoing craft, because, with few exceptions, our present national standards are in excess of Convention requirements. The gain in safety standards chiefly consists of bringing foreign flag ships up to a point nearer to our own.

The Rules for the Prevention of Collisions at Sea—the rules of the nautical road—were considered at London and certain revisions were agreed to. They are not included in the Safety Convention because of the desirability of securing substantial unanimity among all the maritime nations before any changes in these vitally important rules become effective. When such substantial agreement has been reached the new rules will come into force by national legislation.

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# The American Merchant Marine

By R. J. BAKER

Secretary-Treasurer of the Merchant Marine Institute, New York City

Ever since the days when the Phoenicians sailed their small craft across the Mediterranean, seafaring has been regarded as a dangerous profession. The literature of the world is rich in describing the perils of the sea. Man's struggle against the mighty oceans is age old, but as time has gone on he has been able to contrive means to overcome, in large measure, these forces.

When you consider the type of ship in which Columbus sailed on his voyages to America, or that used by Magellan on his history-making trip around the globe, you must admire the courage of these hardy navigators and their crews. Much has been done to make the ships of the world safer since those early days. As Americans, we can be proud of the fact that our nation is among the foremost in ship design.

Naturally, these improvements have tended to make ships and seafaring much safer. But here again the United States has taken the lead and has done more than any other country to make its ships the safest in the world. This is not some recent record covering a short period of time, but it was not until 1910 that statistics on the subject were first compiled by Lloyd's Register of Shipping. According to that renowned authority, since 1910 and excluding the two war periods, American shipping has been nearly twice as safe as world shipping.



These figures disclose that since that date, the annual average percentage of total tonnage lost for the world was .74 per cent as compared to .42 per cent for the United States. No other maritime nation has a percentage lower than that of this country. All types of ships are covered in this study—passenger liners, freighters, and tankers.

This period covers some notable ship disasters and for those who would remind us of the *Morro Castle*, let them also remember that the *Titanic*, the *Vestris*, the *L'Atlantique*, and a host of others were flying foreign flags when they came to their sad finish.

This country's excellent record for safety on the high seas is due, in the main, to the high standards for ship construction and the caliber of officers and men who sail these ships. As is frequently the case, virtue goes unrewarded and unrecognized. There are few American travelers who are aware of the fact that neither the construction of the *Queen Elizabeth* nor the *Queen Mary*, the two largest ships afloat, complies with United States safety requirements. This does not mean that the two famous British liners are unsafe, but merely that they do not meet our high standards such as are incorporated in the liner *America*.

This knowledge surprised even a Congressional committee when it was brought to their attention recently by Admiral H. C. Shepheard, Chief of the Coast Gaurd's Office of Merchant Marine Safety. Another notable example of the lower standards for foreign passenger liners is the former German liner *Europa* which was given to this country at the conclusion of the war. After a few trips, the American authorities came to the conclusion that the *Europa* was nothing more than a floating fire trap and would require drastic and costly rebuilding before it could operate permanently under the American flag. Consequently, it was turned over to the French who are now in the process of rebuilding the liner. They have since renamed it *Liberte* and it will be interesting to see what changes have been made to improve its safety.

These cases are not cited in an effort to lower American standards but merely to demonstrate that other countries still have a long way to go in order to meet our safety requirements. Recently, another conference on safety at sea was held in London to raise universal standards and some steps were taken toward having all nations adopt the same interntional standards.

While America has pioneered in peacetime safety it has also compiled a remarkable record for safety under the adverse conditions of war. Some 570 American merchant ships were sunk from direct war causes in the recent conflict. This means, on the basis of an average crew of 50 men per ship, approximately 28,500 men were victims of shipwreck. But of this number who were exposed to the perils of the sea as well as to enemy attack, only 5,565 were lost. In other words, when disaster did strike, improved safety equipment such as modern life rafts, life boats, life-saving suits and the presence of escort vessels, enabled 80 per cent to be rescued.

So far as merchant marine casualties are concerned, the blackest days were in 1942 when 317 American ships went to the bottom and 3,186 men were lost. German submarine activity was at its peak, but the men who survived these sinkings went back to sea in other ships.

Many of the wartime developments in life-saving equipment have been carried over to peacetime. As a result of the war, the modern life boat carries everything that would be needed in the event of a disaster. The equipment ranges from fishing tackle to an automatic wireless set.

While the American merchant fleet has long concerned itself with the safety of passengers, officers and crew, and also the cargo entrusted to it, the merchant marine has another responsibility insofar as safety is concerned. I speak now of our national safety.

The American merchant marine is the fourth arm of our national defense. Without a large, active and modern American merchant fleet, the Army, Navy and Air Force would be unable to wage an offensive war. Our military forces would be doomed to waiting for the enemy to arrive on our shores and our country would become the battleground.

The recent war furnished numerous examples of how our military and naval strategy were dependent upon merchant ships for their success.

The invasion of Africa had to wait until sufficient merchant ships could be assembled to transport the supplies and troops necessary for such an undertaking. It was 11

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months after Pearl Harbor before we could strike our first real offensive blow. We were paying the price then for neglecting our merchant marine in the years following World War I.

An emergency shipbuilding program eventually attained full production and when it did, we had the cargo carriers needed in the great build-up for the D-Day invasion of Normandy.

The war in the Pacific resolved itself into a war of great distances and oil. Our airplanes couldn't get off the ground and our naval vessels couldn't move unless they had fuel for their always-hungry engines. To bring it to the Air Force and the Navy, American tankers maintained a virtual shuttle service across the broad Pacific.

These are but a few instances of how our merchant marine aided directly in the war effort. The means for waging war also had to be guaranteed and in this connection American merchant ships served well in maintaining from overseas a steady flow of raw materials needed by war industries. Much of our foodstuffs for our fighters abroad and our workers at home also had to be imported.

But national safety consists of more than fighting the enemy in time of conflict. The economic welfare must also be protected in time of peace. And in this role the merchant marine makes a tremendous and vital contribution.

In many sections of this country, this country's world trade is not fully understood. Some forget that at least ten per cent of our workers are engaged in production for export. In many industries such as manufacturing, this percentage runs much higher. This export trade represents in many instances the difference between unemployment and the well-known "full dinner pail."

To have a well-balanced world trade, our exports should be matched by imports. As wealthy as this country is, it is not self-sufficient and it is dependent upon outside sources for many raw materials and commodities.

In the import field, the question of national safety is directly involved. Mindful of the shortages that were experienced during the war in critical materials, the government has instituted a stock-piling program. There are many items on this list but the most important, from the standpoint of the amounts to be imported, are chrome, manganese, bauxite, lead, petroleum, rubber, sugar, tin, zinc, tungsten, vanadium, and antimony. The sealanes over which these products travel are truly the *lifelines* for the United States.

It is in the national interest that this overseas trade be carried in American merchant ships. They are in the position to furnish fast, regular and dependable service to every quarter of the globe. To Propeller Club members here today I know I do not have to urge them to "SHIP AMERICAN." They have been preaching this good gospel for many years.

All of us in the American maritime industry know that critical days lie ahead for the American merchant marine. We have an outstanding record for safety which should be brought to the attention of all Americans. Our citizens should also be made to understand the great need for maintaining their merchant fleet.

Let us keep American ships safe and keep America safe with ships!

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# Accidents Occurring on Passenger and Cargo Ships to Crew and Passengers

By THOMAS DWIGHT MORRIS
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Moore-McCormack Lines, Inc., Brooklyn, N. Y.

In 1947 the Merchant Marine Index Bureau reported that there were 32,353 injuries to seamen. The figures for the first half of 1948 showed that 18,437 seamen were injured. Those figures represent the result from an exposure of 72,000 men on 1800 ships. For the year 1947 you can add 26,377 seamen who suffered illness, giving you a total illness and injuries for 1947 of 58,730.



There is a lot to be done in the marine industry before we can say that our ships are safely and efficiently run. And just one more figure. We determined in my company during 1947 for accident causes alone our average was approximately $100 per crew member. In a 35 ship fleet you can appreciate the expenditure involved.

For the purpose of analysis we classify our accidents according to six basic accident causes:

1. Incomplete operational procedure or design
2. Departure from operational procedure
3. Inherent hazards
4. Personal hazards
5. Workmen's methods
6. N. O. C.

Under these basic causes are sub-headings, as far instance, under incomplete operational procedure or design we have the following subtitles: (a) Failure of ship's gear (b) Gangways and accommodation ladders (c) Unguarded machinery. We have found in the year 1947 that the greatest number of accidents aboard our vessels occurred under the basic accident cause No. 2, Departure from operational procedure and under No. 5, Workmen's methods. Now in order to get along with some actual case histories, I will give you examples under each of the basic categories.

Incomplete operational procedure or design—A junior engineer making a routine inspection of the engine room while on watch was injured when a belt on a compressor flew off and hit his head, almost entangling it in the compressor. The initial fault here was lack of a guard on the machine. In other words, the design of the machine was incomplete. It lacked an essential safety feature. The responsibility there was not too readily assigned. But after the one accident it becomes the immediate responsibility of the watch officer and the chief engineer to see that a guard is requested for the machine. It further becomes the duty of the safety department to follow up the request and make certain that the guard is installed.

An example of a departure from operational procedure, which was also a fatal example, occurred on the LINK SPLICE in 1945 while at one of the Hawaiian Islands. The following is quoted from the master's report:

"The chief officer met death by accidental means aboard the vessel, in the line of duty at approximately 1905 November 4, 1945. He was the only deck officer on watch at the time. The ship's gangway was so rigged that it could be raised or lowered as the tide came in or out (ebbed or flooded). The hauling part of the block and tackle to the gangway bridle was fair-leaded back to No. 4 hatch port winch-nigger head, and made fast on the drum with several turns.

"I, the master, was out on the deck, outside of my room at 1900, and noticed the gangway was in need of raising. I stepped down to the chief mate's room to notify him of this, and he wasn't in his room. I stepped in the purser's room and asked him if he had seen the chief mate recently, talked several minutes. I left his room to see if the chief mate had returned to his room, when I heard screaming and hollering on deck. The purser and myself immediately ran out on deck, we met the electrician and the third asst. engineer running up on the poop deck.

"The ship's electrician had heard some strange banging on deck, and went out to see what it was. He immediately observed the ship's gangway hoisted up in the air and tilted over, he thought there was something wrong (knowing how the gangway was rigged) and ran up on the poop deck back to No. 4 port winch. He discovered the chief mate held firmly to the nigger head with the gangway block and tackle hauling line wrapped around him and the nigger head five times. He shut the winch off and ran and hollered for help.

"Myself and the officers mentioned came out, and immediately cut the line, and got him off the winch nigger head. I immediately called to the watchman on the dock to call a doctor. I sent the third asst. engineer to an LST which was loading troops on the beach 500 feet away to get a doctor. We laid the chief mate on a blanket and his face was swollen, and very purple, his clothes were all ripped and full of blood, and his body was severely lacerated, from the ropes being so tightly wrapped around his body.

"The cause of death is as follows:

1. The chief mate saw the gangway needed hoisting.

"2. The chief mate turned the power on the winch which set the nigger head in motion at dead slow speed (first point on the circuit breaker). He then evidently ran around and grabbed ahold of the line on the nigger head to hoist the gangway up. His hand must have gotten caught in the rope on the nigger head as it went around the drum slowly (we had to pry his hands loose from the rope) as he had a deathly firm grip on it. This threw him over the nigger head with the rope wrapping around him until the gangway came up as far as it possibly could come, and the winch stalled. His head must have hit on the edge of the winch case housing knocking him unconscious as there was no look of pain on his face. There was no apparent pulse or heart beat or breathing when we laid him on the blanket after removing him from the winch nigger head. Two doctors arrived from the LST about the same time. Adrenalin was administered directly to the heart, and no reaction took place. The doctor pronounced him dead at approximately 1940."

There you have the story that involves a departure from operational procedure by a competent, intelligent ship's officer. The man had an excellent reputation with the company. He was trying to do something that required at least two men.

An accident which I classify under inherent hazards occurred on the SS BERKELEY VICTORY while docking at Argentina. An able seaman was putting a rope stopper on a mooring hawser to hold the strain while the hawser was being transferred to the bits. While the seaman was making the turns with the stopper, an unexpected strain was put on the mooring hawser through the effect of the wind or the tide, and the man's hand was caught between the stopper and the mooring hawser.

The second officer fortunately was alert and cut the stopper as soon as he saw what was happening. His action probably saved the man's arm. It could not be said that the man was doing his job unsafely. He was an experienced seaman and had performed the operation many times. But those of you who are familiar with this particular deck operation can recognize that it is inherently dangerous and even with skill and extreme caution, injuries can occur.

There are, however, certain conditions that help to avoid this risk: deck space should be clear, adequately lighted and dry, and last, but most important, personnel should be aware of the danger of their operation, and of proven skill in the particular task before it is assigned to them.

The basic accident cause labeled personal hazards is one that covers a large field of mostly minor injuries. Examples would be foreign bodies in the eye received by a mate on watch, dermatitis resulting from many causes, such as wearing sweaty clothing in the tropics. There are also many burn cases that fall under this group heading. A good example was an actual case we had on the SS MORMACHAWK in 1947 where a man was lighting a cigarette and the burning head of the match went into his eye. Prompt first aid administered by the Chief Officer prevented the injury from developing into a serious case.

A representative accident attributable to workmen's methods occurred on one of our vessels when an able seaman had been sent by the mate in charge of the hatch during discharge operations at night to replace a burned out cluster light in the deep tanks. When the seaman was returning to the hatch with a bulb in his hand, he fell from the ladder and broke his leg. You can see that this might even be considered departure from operational procedure.

The mate should have sent for the electrician. Also the bulb should have been passed down the hatch and not carried in the man's hand. But there are certain details that by necessity you leave to the personnel doing the job. In this case the electrician was not available. The mate did the next best thing. He sent the seaman who was standing security watch. It did not occur to the mate that he had to instruct the man on how to come down the ladder. The man himself used a method that resulted in his injury.

Now when it comes to corrective action, we have to keep in mind over how large a field our corrective action must be spread. When these accident reports are received and analyzed by the safety department, the chances are that the individual ship and the individual personnel have learned a lesson. Where design is at fault; where methods are wrong; where procedure is unsafe; the information in the hands of the safety department must be promulgated to the entire fleet. The lesson of one ship must be passed on to the personnel of others, and with a high rate of personnel turnover, the ship's officers afford our best means of indoctrinating the men. We must keep our officers informed of the latest safety practices, and we must insist that they apply these practices. They must investigate and report their accidents, and they must lead and direct their crews in the known safe methods.



The prevention of injuries to passengers offers an entirely different problem. Obviously a program of safety indoctrination is out of the question, and the only action we can possibly take is to design our ships and their fittings to eliminate known accident hazards. Incidental use of posters and warning signs will of course have some value, and their use should not be overlooked. But designing against passenger accidents is the only effective action we can take.

In a home a carpet is a common furnishing, and we do not have to consider it as a particularly dangerous article—unless it is laid over a highly polished floor! But on a ship, carpeting may become a distinct hazard. We have had a number of accidents reported—fortunately none of them were serious—in which passengers tripped over a carpet edge or wrinkle. Experience has shown that this can be overcome by laying the carpet well-stretched, and securing its edges firmly.

Ship's furniture is another source of passenger injury, although much has been done in recent years to overcome this hazard. All of you remember the swivel chair on a fixed base which was so common in all ships not so very long ago. It was perfectly safe, for it could not be overturned, and one could not possibly fall out of it. When this type of chair was done away with, the conventional chair was either made with somewhat shorter legs, or the legs were spaced a little wider apart. The intention of course was to design against the possibility of overturning.

Just before the war an accident occurred on a passenger ship which involved both carpeting and chairs. The ship in question had a large lounge in which movies were shown during the afternoons. The floor of this lounge was almost completely covered with a huge carpet. This carpet was so heavy that it had not been considered necessary to secure it in position.

For the movie show the deep arm-chairs and chesterfields were re-arranged in rows facing the screen. These were supplemented by chairs from the writing desks and other incidental chairs. There were also a few collapsible ones. At the time the vessel was rolling easily, not going beyond five degrees, and it was decided that the movie could be shown without difficulty.

About half an hour after the show commenced the vessel rolled rather heavily to starboard. (It was later determined that the quartermaster had let the ship run off course, and had applied about half helm in order to bring her back quickly.) One or two of the passengers seated in the lounge chairs started to slide toward the starboard side of the lounge. Before the ship had begun to return to an upright position, at least half of the chairs with their occupants had skidded to starboard, taking the heavy carpet with them. Fortunately, although there were numerous bruises, no serious physical injury was sustained.

Perhaps the greatest suffering was sustained by the company as a result of the bad advertising received from the few individuals who left that ship convinced that the ship was unseaworthy and its crew incompetent. Here is a case of the design not being completed by fastening the carpet.

The fitting of hand rails and grab rails is another important item. Their value is so great that it is well to remember that artistic perfection of interior design may have to be marred by necessary protective devices.

In the accidents I have listed today, corrective action was apparent, and was carried out in each case. However, it is much more important that the lessons learned by individual ships be handed on to other ships of our fleet.

I would like to say in conclusion that only through the cooperation and interest of the entire marine industry, labor and management included, can we hope to control the accidents to the personnel on our ships. Indoctrination must be effected, and the efforts of labor and management must be toward the stabilization of our crews, so that proper indoctrination can be accom-



plished. The reports of these meetings of the Marine Section have shown that our steamship companies and our labor unions are desirous of cooperating to keep the American vessel the safest on the seas. To reach this goal we all seem to need some positive direction; some real navigational instruments.

One of the first elements to be explored when a safety program is to be initiated is the accident experience. Nowhere can we find a complete tabulation of the accident experience of the marine industry. That fact exists not because of the particular lethargy of any of our group, but rather because the industry and its method of employment is unique. We cannot compare the function of a ship's crew at sea to the eight-hour shifts of industry in general. The accident to a seaman off watch is as important as the accident to a seaman on watch. The statistics committee of our marine section has made a start. They have suggested to the National Safety Council a method of computing accident frequency that would apply aboard vessels. Probably this suggestion will be forwarded to the members of the Marine Section at some future date.

If we once get a system of accounting, perhaps we can see where the safety engineering should be first applied.

Frequency figures, to be really convincing and worthwhile, must be correlated with accident and insurance costs. The marine industry cannot accept 30,000 injuries to its seamen in a year. That figure is a direct challenge to the far-sighted competence that has made our industry the foremost in the world. We all have to cooperate, earnestly work together with instruments commonly understood by all. Let us get our insurance figures out of the dark and out on the table where they can be used for our common good. Let us tabulate our accident experiences according to some accepted plan so that every member of our industry can read them and profit thereby. When this cooperation and interchange of experiences is accomplished, our safety goal will be within easy reach.

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## Accidents to Personnel on Board Bulk Carriers Operating on the Great Lakes

By D. L. BUCHANAN
Manager of Industrial Relations, Pittsburgh Steamship Company

The short sailing season on the Great Lakes is a busy one and the bulk freight carriers endeavor to make as many trips loaded with as much cargo as is possible. The speed with which our vessels are able to load and unload and the fact that approximately only 3½ days are required to make the trip from their loading port on Lake Superior to the unloading port on lower Lake Michigan or Lake Erie is in itself remarkable.

The 62 vessels operated by the Pittsburgh Steamship Company are primarily engaged in the transportation of iron ore, limestone and coal. In their round trips it is necessary for all vessels to pass through St. Mary's Canal at Sault Ste. Marie, Michigan, twice. Here they are locked up and down the St. Mary's River, either from or to Lake Superior and Lake Huron, an operation which consumes about an hour of their sailing time. At this place a central point is found at which stores, mail and laundry are placed aboard each vessel at any time of the day or night. This operation necessitates handling of lines, discharging of such items as laundry, empty containers and cases, as well as receiving large quantities of supplies, laundry and the storing of them.

A vessel loading its cargo at the head of the lakes will customarily do so in approximately six hours and will be unloaded at its lower lake port in about the same number of hours. It can readily be seen that in the complete operation the crew members have been busily engaged with the handling of lines, hatches and all other equipment.

Most of the accidents sustained by personnel aboard bulk carriers on the Great Lakes are attributable to carelessness on the part of the injured seaman. In analyzing our lost time injuries for the season of 1947 from the standpoint of cause and responsibility, it was found that 93 per cent were the injured's own fault. With due consideration to the construction necessary to fit the vessels for carrying their cargoes of iron ore, limestone and coal, protective devices have been employed. Despite the installation of safety equipment, the human equation is chiefly the cause of all accidents. I shall endeavor to give you the details of some of our typical injury cases.



On the fifth day after attaching to his ship during spring fitout, a thirty-three year old ordinary seaman serving as deckwatch was assisting the second mate and another seaman in removing the anchor chains used as winter moorings from the river bank. This deckwatch was ordered to go aboard the vessel to obtain two hammers from the engineer. He secured a sledge hammer weighing about 14 pounds and a machinist's hammer. In descending the ship's ladder, he carried these tools over his right shoulder, grasping the hammer handles with his right hand. When about half way down, he missed his grasp and fell over backwards, landing on his back on the wooden platform or catwalk extending out from the bank of the river. He fell a distance of 10 or 11 feet and sustained a compression fracture of the twelfth dorsal and first lumbar vertebrae causing him to be off his ship for 86½ days.

An investigation revealed that this was a 28 foot regular ship's wooden ladder securely lashed in position amidships and held firmly in position at the bottom between two 2x4 timbers, which were nailed in place on the platform. Inasmuch as the vessel was still in her winter mooring berth, the ladder rigged in this manner was on an estimated angle of 65° to 70°. The accident occurred in broad daylight with the weather clear and the wind blowing strong from the south.

The injured man stated that the rungs were clear and dry and that he had no recollection of slipping. The canvas parcel bag, which customarily hangs by the ship's ladder when the vessel is in port during the season, was not yet over the side. In looking back upon his accident, the seaman said he should have thrown the tools from the deck onto the bank or lowered them by the use of a line.

The facts surrounding this accident are similar to most of those involving the use of the ship's ladder. The officers and safety committees repeatedly warn our men to have both hands free when descending or ascending the ladder.

A check of our casualty experience a few years ago reflected that numerous accidents were sustained by our seamen while handling mooring lines. In analyzing these cases it was found that the injured men were not properly using the becket attached to the eye of the cable, but were committing the unsafe act of placing their hand between the eye of the cable and the spile.

Many of these cases were serious since some of the men were maimed for life due to part of the hand being amputated. A concentrated effort was made to reduce the number of such accidents to our personnel by continually high-lighting this hazard to the mates and safety committees. This constant repetition has apparently produced results since our records show that in 1945 there were 16 injuries from handling lines, 1946 it was reduced to 6 cases and in 1947 only 3 such injuries. In the season of 1948 to date, only one injury has occurred in this category.

The facts surrounding one of our mooring line accidents was as follows: Under the orders from the first mate, a young deckhand was handling the ship's lines on the coal deck in preparation for shifting the vessel astern for loading purposes. While attempting to remove the eye of the cable from a spile, he inserted his left hand between the eye of the cable and the spile instead of handling the line solely by the becket provided for that purpose. Before he could throw the eye of the cable off the spile, the cable became taut and crushed his left hand, necessitating the amputation of his first, second and third fingers at the proximal joint and lacerating his fourth finger.

An investigation of this accident revealed that the seaman had safely handled the mooring cables many times previous to this occurrence and had been properly trained by the third mate in the safe way of performing the job. The experienced seaman operating the mooring winch had payed out the mooring cable upon instructions from

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the mate, but it had apparently suddenly become taut by the slack becoming wedged between the ship's side and the dock. At the time of this accident, the winch was in a "heave out" position and the mooring cable was slack from the drum to the side of the ship. Because of prongs protruding horizontally to the face of the dock from the top of the spile, the seaman stated that he encountered difficulty in trying to remove the eye of the cable from the spile. He stated that he had his right hand in the becket, but he had placed his left hand between the eye and the spile. This accident occurred at 6:15 A.M., with the weather cloudy and a light south wind. The ship's decklights, cabin lights and dock lights, as well as the lights on the coal rig were all burning brightly at the time of the accident.

Eye injuries still comprise a large number of our accidents, even though safety goggles have been placed aboard each vessel with instructions to wear them on every job entailing an eye hazard. A typical illustration in this category is that of a deckhand who was chiping rust off the coalbunker bulkhead.

When he was assigned to this work, he was furnished goggles and wore them. However, he claims that they became fogged and *he permitted them to hang around his neck.* Inasmuch as he continued to chip with a small hammer with the goggles in that position, a small particle of rust or paint got into his left eye. As a result, he developed a corneal ulcer causing him to detach from his ship for a period of six days while receiving medical attention.

*Another pointed,* but pathetic case of an eye injury, is that of a young man, an oiler, who was the victim of his friend, a fireman, who playfully threw a block of wood, which *struck the boiler,* bounced off and struck the oiler in the face, breaking his glasses. A large piece of glass became imbedded in the eye having the best vision and in addition to *his even more impaired* vision and needless suffering, he lost 36 days away from work. His hope of obaining a license and a career as a marine engineer had to be abandoned.

One of the hazards aboard bulk carriers is the danger of falling into cargoholds when the hatches are open. In order to forestall developing a habit which might cause an injury, the men are repeatedly warned not to walk on the hatch covers even when they are closed. A fall into the cargohold of a light ship is potentially fatal, since the seaman will fall a distance of around 25 feet onto the steel cargohold floor.

An illustration of this type of accident, which fortunately was not too serious, is that of a deckhand who was assisting a watchman pull a water hose from the dock onto the vessel in order to rinse down the deck. The watchman was standing on the portside facing the dock while pulling the hose aboard. The deckhand was pulling the hose athwartships toward the starboard side where is was to be connected.

This ordinary seaman with two years experience was walking backwards in the space between the hatches, but was having difficulty with the hose catching on the butterfly knobs which are eyebolts about two inches high fastened to the deck for securing the telescopic hatch leaves. He stepped *upon the hatch leaves in order to* pull the hose on top of the hatch. While walking backwards on the hatch leaves toward the starboard side, he fell into the cargohold. *Fortunately, this seaman held onto the hose,* which partially broke his fall. He landed on his right arm and sustained a badly fractured right elbow.

In talking with the *injured man,* he related that he knew some of the hatch leaves on the starboard side of the vessel had been opened in order to provide light for *the crew members* who were removing the bolts from the manhole covers in the cargohold. He said that the hatch leaves were dry and that he merely backed into the opening. This accident happened in midafternoon with the weather not being a contributing factor. Since the vessel was lying at the shipyard, the injured man was in the hospital receiving medical attention within twenty minutes after his fall.

In an analysis of our injuries for the year 1947, we were somewhat surprised to *find that 54.8 per cent of the men sustaining* lost time injuries had sailed for more than one year. When compared with the 9.6 per cent for those who had sailed from *six months to one year* and the 35.6 per cent for the injured men with one week to six months sailing experience, it appears either that the old saying "familiarity breeds contempt" *is true or else the experienced* men are performing more hazardous jobs.



A case in point is that of a third mate, who during the fitting out of his vessel was instructed by the second mate to go to the windlass room of the barge tied up alongside and remove the ¾" breast cable in order to spring his vessel out forward for the purpose of painting the port bow. The *third mate, in taking the turns* of the cable off the timberheads, disturbed the ¾" wire cable fastened to the same timberhead and holding the barge's anchor. The barge's anchor was released and a *turn of* its cable jammed the third mate's right leg against the timberhead as it paid out.

This officer sustained a compound comminuted fracture of the tibia above the ankle. This accident happened just shortly after noon and the injured man said that the windlass room was well lighted. In considering his accident in retrospect, he said that he should have traced the breast wire and made sure he was releasing the right cable. Despite the seriousness of the occurrence, *this third mate considered him*self fortunate that the anchor reached the bottom before the cable had time to amputate the leg.

This same survey reflected that 53.4 per cent of our injured seamen were 30 years of age and over, while 30.2 per cent were between 21 and 30 and, startlingly enough, only 16.4 per cent were 20 years of age or under. The preconceived notion that the majority of those injured were the young, inexperienced men has been exploded. Either the quicker reflexes *of our younger men or* the close supervision and detailed instruction given them because of their youth accounted for this.

A tragic fatality was that of a 49 year old boatswain with 25 years' experience on bulk carriers. This seaman was sitting on a staging facing the port bow and was attempting to pry the log anchor shackle away from the ship's side with a three foot pinch bar. He apparently did not have the bar firmly wedged since when he applied pressure by placing his *foot* against the hull of the ship, the bar slipped causing him to lose his balance and fall backwards, dropping a distance of eighteen feet into the water. This seaman was heavily dressed and drowned before he could be rescued.

Prior to his demise, this employee as a boatswain, had supervised the work of the deckhands and in accordance with the company rule had the deckmen performing any work entailing the hazard of falling into the water wear a kapok safety life jacket. He was a member of the safety committee and familiar with the safety equipment aboard the vessel and its recommended use.

The hazard of working around moving *machinery is accentuated on a vessel* because of the movement of the ship. One illustrative case is that of a 46 year old oiler, who was turning the grease cups on the eccentrics *in the lower engine room* while the engine was in motion. His hand slipped causing him to lose his balance, and his right hand was caught between the eccentrics. *This oiler's right ring finger* was amputated between the proximal and middle phalanges. The accident happened during the daylight hours and in addition there was good artificial illumination. The injured man said the accident would not have happened had he exercised a little more care.

In leaving and returning to the vessel while in port, some seamen elect to walk along the concrete face of the dock rather than use a safer means of ingress and egress. One such case is that of a coalpasser, who was returning to his vessel accompanied by another crew member early in the morning. While walking along the dock wall near the bow of the vessel, he slipped and fell into the water. One of the deckmen quickly tossed him a ring buoy, but he was apparently unable to hold *onto it.* The operator of #1 Hulett moved his machine down to the location and with the bucket closed went into the water and scooped the coalpasser up like a fish and placed him on the deck of his vessel, none the worse for his experience except for a cold bath. Fortunately, this accident appears humorous now, but at the time it was a potential fatality until this seaman was rescued from the slip. The coalpasser said the only reason he did not use the safe dirt roadway adjacent to the dock wall to get to his ship was that he would get his feet dirty. The dock was in good condition and no foreign objects were observed at the place where the coalpasser claims to have slipped. He may have been a little unsteady on his feet, inasmuch as he was returning from shore leave.

Frequently kerosene is used in the engine room of bulk carriers to wash grease from

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parts of the machinery. Almost without exception, the inexperienced seaman seems to have an uncontrollable urge to throw these waste rags and kerosene into the furnace. One such instance was that of a coalpasser with one month's experience, who, in attempting to throw some used kerosene and an oily piece of canvas into the furnace, received a second degree burn of the right arm from his wrist to his shoulder. It was necessary to hospitalize this seaman since some infection developed and as a result of this burn, he was off his ship for a period of seven days. As he was about to do this unsafe act, this coalpasser was observed by the second assistant engineer, who at once shouted a warning to him, but it was either not heard or came too late.

*In the past* we have had fireroom personnel severely burned in attempting to start or rebuild a fire by using kerosene or *other* volatile liquids. It has been recognized that this practice is extremely dangerous since explosive vapors may be formed, which can result in damaging flarebacks when ignited. Steps have been taken to have this practice discontinued. It has been recommended that live coals be obtained from the other furnace to start the fire or, if this is not possible, kindling wood should be used.

The unlicensed crew aboard bulk carriers learn how to handle the equipment by on the job training. The licensed officers and members of the safety committee show and tell the new man how to safely perform his job. After being instructed, he is observed to make sure that he is properly and safely handling the equipment.

For instance, an ordinary seaman is shown the safe procedure in opening and closing hatches, whether it be on a wooden hatch vessel, one with telescopic leaf hatches or a single piece hatch ship. If this seaman were on a ship with telescopic hatches, he would be first assigned to placing one end of the bridle on the hatch knob located on the center leaf. He would be cautioned not to stand on the hatch, but rather on the deck between the hatches to avoid the danger of being thrown into the hold. This man would also be warned not to follow the hatch too closely as it was opening or closing, since if one of the leaves became fouled there would be the danger of its coming askew into the space between the hatches. This same ordinary seaman would be instructed that in being landed on the landing boom, he should hold tightly onto the rope and wait until his feet touched the dock before getting off the bosn's chair. He would have been cautioned that in handling the mooring cables, he should use only the bracket and to stand back out of the bight of the line. Many of the instructions given this seaman are contained in the Lake Carriers' Association booklet *Recommendations For The Prevention Of Accidents Aboard Ship.*

This same personalized "learning to do by supervised doing" is employed regardless of the man's rating aboard ship and whether he is being shown how to feel the engine or operate a steam winch.

*To supplement* this type of oral instruction, seamen in the deck crew are furnished with a *Manual for Lifeboatmen and Able Seamen,* published by the United States Coast Guard and to those in the Engine Department, a Lake Carriers' Association handbook of *Duties and Information For Coalpassers, Firemen, Oilers, on Great Lakes Vessels,* is made available. These publications contain the information the seamen must learn to obtain certification as an ablebodied seaman, oiler or fireman.

Under the auspices of the Lake Carriers' Association a winter navigation and engineering school is conducted to assist experienced seamen in preparing for their examination for an original license or a raise of grade in their present license. During this course, they receive instruction on equipment aboard bulk carriers and are given a course in first aid. This training of the licensed officers helps qualify them as instructors of the unlicensed men.

Our aim and purpose is to reduce the number and severity of the accidents sustained by our personnel. To this end the injury reports received are carefully analyzed and studied. The primary causes of our lost time accidents are (1) failure to recognize an unsafe condition or practice, (2) error in judgment, (3) failure to establish safe working procedures, and (4) violation of specific instructions.

If we are to achieve our goal of reduction and eventual elimination of personal injuries aboard bulk carriers, our safety prog[illegible] must be geared to remedying the



hazards high-lighted by the causal classification analysis. In our fleet this focuses attention upon the continuing need for training and instruction of the individual seaman to insure his being safety minded. The minutes of one of our safety committees aptly expressed the thought recently as follows:

"We agree that personal contact is one of the most effective ways to promote safety. Upon observing a crew member performing a duty in an unsafe way, the supervisor, or in our case the mates, engineers and boatswain, must approach the crew member in the proper manner at the proper time and explain not only the proper way to perform the job, but also how he was doing it wrong in the first place."

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## Accidents to Personnel on Board Oil Tankers

By CAPT. E. W. FISKE, JR.
Marine Transportation Department, Socony-Vacuum Oil Company, New York City

Safety is an important subject with Socony-Vacuum, just as it is with many other forward thinking and progressive companies. Safety efforts are company-wide, with regular programs and supervisors in all of our refineries, bulk terminals and similar land installations. Ships, though, present somewhat of a different problem when it comes to setting up specific safety programs.

Of course, we use all the standard methods aboard our ships for making our men safety-conscious. This is in addition to installing safety equipment wherever it is needed or seems to be needed. We find our bulletin boards valuable in this respect.

One way in which we promoted safety recently was a slogan contest in which everyone aboard our ships was invited to submit a slogan in less than 10 words on the dangers of shipboard smoking. We got several thousand answers—many of them pretty bad, as you might expect. But the general result was just what we had hoped for, a lot of consciousness about the dangers of shipboard smoking.

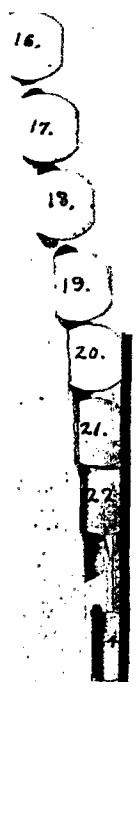
Such devices as this work fine. Our captains reported to us, at the conclusion of the contest, that their men were more conscious than ever of the dangers involved in a surreptitious cigaret. Trouble is, though, the results are only temporary. Altogether too soon for us, the matter will slip back again into whatever recesses of our men's minds that such things usually go.

We're finding that our suggestions system—another company-wide plan—also has a definite safety value. Recently Socony-Vacuum modernized and liberalized its suggestions system to make it more profitable for the employees. This fact has been well established with our employees. Hence they're out to earn every dollar they can with suggestions—and safety suggestions pay off just as well as any others. I might add, too, that some absolutely swell suggestions have come to us as a result of it.

In one case I know of, we paid out $100 to a crewman who suggested a comparatively obvious safety suggestion. I heard several criticisms that $100 was too much for something so obvious. On the other hand, no one else had ever suggested it. And, in the second place, it eliminated a hazard that could well have cost the company several thousand dollars or more, or even have resulted in loss of life. Money spent for safety suggestions is money very well spent, regardless of the amount.

I worry about the intangible element of safety: that matter of men's minds and what *makes them do* those things that endanger themselves and their co-workers and company property as well. We can keep *putting up safety posters,* we can go on paying off for safety ideas to keep our people safety-conscious, we can make awards of various kinds to ship crews for good safety records—but what can we do to prevent or guard against the one, unthinking moment in a man's life when he's pure, plain jackass?

Take one case aboard one of our ships recently which cost us more than $1,300 in a claim. Here was a junior engineer, who's



thoroughly capable in every respect, and with a lot of experience aboard our ships. He's a good, sincere intelligent man who, unfortunately for us, in this instance, also prides himself on his figure. His usual custom is a series of daily calisthenics to keep his stomach flat.

He came off watch one night and, as usual, started in on his exercises. In bending over and stretching his arms, he dislocated his shoulder. The cause of this accident, purely and simply, was over-exercising. No equipment was at fault or anything like that, of course. But what safety precaution can we advocate, I ask you, to prevent a recurrence of such an accident and a cost to us of even more than $1,300?

In the same category is an accident on another of our tankers wherein a man who was painting a ventilator fell off and received injuries which cost us around $8,000. According to this man, he requested a ladder but was told by the Bosun to stand on the awning spreaders to do his painting.

While this man was painting, the boiler tubes were blown and the wind blew soot and dirt into the man's eyes. It was this which, he said, caused him to lose his balance and fall. Two people were at fault here, of course, the Bosun for not supplying the ladder and the man for not being more cautious while in a dangerous position. Again, though, how are you going to set up rigidly inflexible rules about when ladders are to be used or are not to be used. And how are you going to instill native caution in a man who probably figures "Well, I reached this present age of mine without anything too serious happening to me; why should I get scared now?"

It's in line with a remark I heard once attributed to a college professor. He said: "You can tell a man there are 270,678,193,-139 stars in the universe and he'll believe you, but if a sign says 'Fresh Paint,' that same man has to make a personal investigation." In other words, to some people, just telling them of an accident hazard is sort of like challenging them to determine whether what you said about the hazard is true.

No, experience in the presence of potential hazards isn't the answer alone. Take the case of a chief officer aboard one of our tankers, a man with more experience than the average of all the others aboard his ship. Recently this ship was getting ready to move from one place to another to complete its loading and the bow line was being slacked up in order to have it cast off from the dock.

This chief officer put his right foot on the line in order to slow it down while the line was running out. As he put his foot on it, the line's speed threw him off balance, causing his legs to spread before he could get clear of the lines and regain his balance. Shortly afterwards he felt pains in his groin and we paid out more than $1,300 for the injuries he received at that time. Does familiarity breed contempt of the ordinary hazards that surround our men?

Despite all our teachings and preachings about safety, there's a certain amount of adventure in a man, too, I suppose, which can lead to pretty sorry results. There's the case of one of our seamen who, while heavy waves were washing over the deck of his vessel, decided to try to close the pumproom door—something that very well could have waited, incidentally, until the waves had lessened. Or, better yet, the door never should have been open when the ship was heading into such heavy weather.

At any rate, a heavy wave hit this man and threw him against the ladder which leads from the main to poop deck, and he received severe injuries which cost the company more than $2,300. The heavy waves and the open pump-room door, I'm afraid, were just a challenge to this man, an opportunity to show that no little old ocean could scare him. But it cost us money, just the same.

Part of our safety program throughout the entire Socony-Vacuum organization, including vessels of our Marine Transportation fleet, includes instructions on the proper manner of exerting strength and lifting heavy objects. How many accidents we've avoided with such instructions, we'll never know. But we *do* know that accidents from such causes still occur despite our best efforts.

Take the case of a third assistant engineer on board one of our vessels. He was using a three-foot stillson wrench in an attempt to turn over the electric bilge pump while his vessel was in a shipyard for repairs. In some way, he applied too much pressure without bracing himself properly to absorb the strain—and he wound up with a hernia that cost us close to $600.

Surely this man should have known better than to try to do what he did—but the fact remains that he didn't know better, or at least he forgot, if he did know better. How can we guard against a recurrence of the same identical accident? No way that I know of, unless it's to warn as many of our men as we can, as we have done, that they should ask for assistance when the work they are doing requires assistance. And to continue our teachings of establishing proper balance when working in cramped quarters, and so on.

There's one more instance I would like to cite to emphasize again that, as far as we are going with our safety efforts, it somehow just doesn't seem to be far enough; and the challenge of safety is one that should interest our best minds and cause us to exert all the ingenuity that we can.

This is the case of a man whose life was lost through a comparatively minor explosion which, nevertheless, never should have occurred. This accident occurred on Lake Erie during an unusually heavy sea. The victim in this case was directed to pump in ballast. He used the blower for a few minutes to exhaust the fumes in the motor room, but apparently turned off the blower before all the fumes were exhausted.

Ordinarily, if this man had been as alert as he should have been to possible hazards, he would have used the deck switch to start the pump motor. Instead he started to descend a ladder into the motor room and pushed the motor switch there. The resultant explosion threw him overboard. Efforts were made to rescue this man and he appeared to be trying to swim toward a life ring which had been thrown over the side. Then he disappeared beneath the water. No lifeboat was lowered because of the heavy sea which was running. The master felt he would be endangering the lives of any lifeboat occupants.

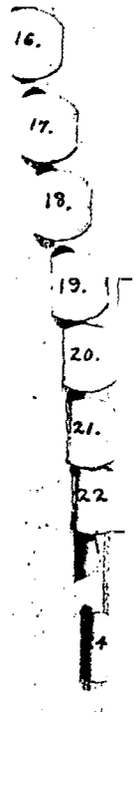


As you can see, this is another of those accidents which never should have occurred. And it won't occur again, I'm sure, as long as with the help of such an accident as this, we can keep our men reminded that blowers should be run, first, the length of time to exhaust the fumes and, second, that crewmen should stand on the deck to operate the pump motor switch.

Summing up, the point I wanted to make in this talk and which I hope I have approached, at least, is that, extensive as our safety efforts are, they just aren't as effective as they should be—and never will be until we reach that happy millennium when shipboard accidents are as rare as that free drink that the bartender is supposed to come across with once in a while.

Admittedly, we're doing everything suggested to us that seems worthwhile—slogan contests, bulletin board posters, ship safety committees, suggestion systems, port safety committees, and so forth. But I don't think that's enough, not enough, at least, to assure us of a steady rate of progress toward that no-accident millennium that all of us would like to see.

While the best brains of industry, particularly the petroleum industry, are giving all sorts of attention toward ways of reducing costs of various kinds, let's give greater and more intensive thought also to ways of saving lives, preventing injuries and of reducing the costs of accidents on our vessels. Such efforts are not only good business and sound economics, but a step also toward proving that our companies are not the cold, impersonal organizations without regard for their employees that so many people would like to believe they are. It will pay off for us in employee and public good will, too.



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**As presented in the Meat Packing, Tanning and Leather Products Sessions of the 1948 National Safety Congress**


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**Volume 16**
**Transactions**
**1948 National Safety Congress**

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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE MEAT PACKING, TANNING AND LEATHER PRODUCTS SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Meat Packing, Tanning and Leather Products Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Meat Packing, Tanning and Leather Products Section carries on in behalf of its members, and for the benefit of accident prevention work in the packing, tanning and leather product industries generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in day-to-day plant safety programs. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on page 19 of this volume.

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# What We Did to Win the N. S. C. Distinguished Service Award

By MERLE STALCUP
Assistant Superintendent, Swift & Company, Kansas City, Kansas

During April of 1947, there had been heavy rains in the Kaw River water shed. The Kaw River was rising at an alarming rate and soon our plant, which is at the mouth of this river not far from where it empties into the Missouri River, was below the level of the water in the river. When this happened, we started our sewer pumps, and the level of the river became one of our main subjects of conversation.

On April 15 an oiler neglected to shut off a steam cock on one of these pumps tightly enough before removing the cap on the lubricator preparatory to oiling the pumps, with the result that a mixture of hot oil and steam blew out in his face causing severe burns. When this happened, a new record for our plant of consecutive man-hours worked was ended. Before this time, we worked a total of 1,021,057 man-hours without loss of time from a disabling injury. This record won us the Distinguished Service Award of the National Safety Council.

Just how we were able to accomplish this is the subject of my remarks. While our record of 1,021,057 man-hours worked without loss of time started about the first of that year, we naturally did not start the spade work for it then. It had its beginning a long time before and gained momentum sometime in 1944, when we put greater emphasis on making people safety conscious. This along with the revamping of our Safety Committee set up and more effective use of posters, bulletins, etc., brought about the results mentioned previously.

Swift & Company regularly employs some 2,000 people there in Kansas City. It is a slaughtering and meat packing plant in which hogs, cattle, lambs and calves are processed. In fact, it might be described as an average plant in that the proportion of various types of livestock mentioned are not too far away from the national average. While we are what is termed a killing plant, we also cut, bone, cure, smoke, manufacture table ready meats, margarine, etc., very little of our raw material being shipped elsewhere for further processing. Since the Kansas City plant is an average plant, it has average problems and is manned and staffed with average people.

It is not a plant that is particularly outstanding in types of mechanical safe guards that are set up for safety purposes, nor is the plant plastered from front gate to back gate with safety posters and charts. When we begin to feel in any way complacent about the safe working conditions with which we surround our employees, we need only to look at the regular monthly inspection of our workmen's safety committee to make us realize that we still have work to do in making our plant a safe place in which to work.

Some time ago, we became interested in a statement that claimed that approximately 80 per cent of all accidents were caused by faulty human behavior and that only 20 per cent were caused by failure to properly safeguard a hazard. It occurred to us that the proper approach and the one promising the most success would be one directed at the source of the greatest number of accidents. We believe we have been rather successful in this approach.

During World War II, as the man power shortage became serious, it became more and more necessary to conserve labor. Around the beginning of 1944, it came to our attention we were losing as many as 250 man-days per month due to Lost Time Accidents. This was quite a sizeable item. We realized that here was an opportunity not only to salvage some badly needed man power, but to eliminate considerable human suffering. We figured that we might salvage upwards of 200 man-days per month, if we could do the proper selling job on accident prevention.

Kansas City has the customary Swift & Company operating organization set up. It has a superintendent, assistant superintendent, several division men and general foremen. These division men and general foremen have supervision over various sections of the plant and have foremen who are responsible to them. We figured if we could begin at the top of the organization pyramid and sell each individual down the line that eventually everyone in the plant would be sold on the idea that accidents could be prevented and that they were not a necessary part of our business.



I don't suppose there is anything particularly new about this. We began by having the division men and general foremen sit in on some of our safety meetings. Not all of them at any one time, but fairly frequently. We also started competition between the safety work of one division man or general foreman with that of another. As you can imagine, this competition did not always work out to the division man's credit. On the other hand, sometimes it did, and we were very impartial in seeing that the other division men knew all about the situation.

We have monthly meetings of all the supervisors in our plant. These include division men, general foremen, foremen and assistant foremen. At each of these monthly meetings, the subject of safety is given a prominent spot. We have weekly meetings between these monthly meetings in which each foreman or assistant foreman meets with his immediate supervisor. The division man and general foreman wishing to better his position in the monthly meetings urges his people to make safety a part of their regular daily job. The spirit of rivalry thus brought about was continued through the year. This rivalry of course extended to the foremen who then vied with each other in the elimination of accidents.

We have one foreman in the mechanical department who holds weekly meetings with his men in which he puts on a regular show. He has an operator perform an operation making as many mistakes as he can from a safety standpoint. The men then point out each one of his mistakes, and quite a few that he did not intentionally make.

This keen sense of interdepartment rivalry and safety consciousness that we have brought about is further reflected in the case of an operator on a stripping roll. This particular operator caught one of his fingers in the roll giving him a permanent disability. He was so humiliated by the fact that he had had an accident resulting in what he regarded as a black eye to his department and to his division that he insisted on coming back to the plant immediately after his injury was dressed and doing work of some kind. When this happened, the messenger boy that we employed in the department was off sick, and the injured man was used on this work. As the injury resulted in a permanent disability, it of course counted as a lost time accident. However, none of us felt like telling the man that this was the case, and to this day he does not know he did not keep his department from having a lost time accident. I mention this in order to show you the feeling that we have been able to engender in all classes of our employees.

The results from all of this work bore a considerable effect in 1945. We continued to improve in 1946. In 1947 we began to reap the real benefits from our program. We established the frequency rate for the year of 5.33. From all indications, our record for 1948 will be better than this. Incidentally, since establishing the record mentioned previously when we operated over 1,000,000 man-hours without a lost time accident, we were able to get as far as 800,000 man-hours worked on two other occasions before a lost time accident occurred.

Being able to operate a million man-hours without a lost time accident was not what we had in mind when we started. We were merely attempting to reduce our frequency rate of which we are very proud.

It might be interesting to give you a little bit of the background of the start of the campaign that resulted in the 1,000,000 man-hours. At our January meeting of the safety committee that year, we were toying with the idea of being able to go a month without a lost time accident. We had never been able to do it before and it looked like an impossible thing.

We thought that if we could go a day without a lost time accident, we could go a week. If we could go a week, we could go a month. If we could go one month, we could attempt two months. Logically,

we could, of course, go a year or even more, although we have never been able to reach this desired situation. We gave this campaign such wide publicity that everyone in our plant knew about it. Our mechanical department had a rush of orders to get safety items finished. Our plan was to go the full month without a lost time accident. This resulted in the record of 1,021,057 man-hours without a disabling accident that was finally ended on April 15.

In supplying salesmen for the safety idea, our safety committee plays an important part. It also handles the more prosaic part of the campaign, the details that go with that kind of program. We have a general safety committee consisting of the assistant superintendent, who acts as permanent chairman, the industrial relations department manager, the master mechanic and chief engineer, our insurance company representative, the fire marshal, the division superintendent covering the plant protection and time office departments, and the safety director.

In addition to these, there are two members appointed by the local unit of the union. While the management takes no part in the selection of these two persons, they do have the prerogative of either accepting or not accepting the individuals selected. If the management does not agree with the selection, then the union must select other individuals that will be satisfactory to the management.

The management selects the personnel of our workmen's committee, consisting of a representative of the mechanical department, a representative from the killing departments, and a representative from the manufacturing departments. Each one of these last serve a period of three months; consequently, there is one new member on this committee each month, and one member retires each month.

In selecting the people for the workmen's committee our practice has been to select employees that have given us most of the trouble from a safety standpoint. While they are not actually opposed to safety, they are inclined to make light of it or are accident prone individuals. It has been our experience that after serving on this committee the retiring members are permanently active for anything having to do with safety. They sell the safety work to our people. In fact, as a rule, these people, while no longer officially members of the committee, actually do us a great deal of good acting in an unofficial capacity.

Our plant is divided into 12 sections. Our safety director along with the fire marshal, the three members of the workmen's committee and the two union local representatives make a monthly inspection of one of these divisions, covering the entire plant once every 12 months. They list all unsafe conditions and practices they find. They report their findings to the members of the general safety committee, which meets once each month. The items are discussed and a course of action decided upon.

In the meeting the supervision of the inspected portion of the plant is present and participates in the discussion preceding the decisions that are made.

The safety director then makes up work orders covering the items which were recommended for correction. These work orders are presented for their signature to the supervisors involved who were present at the meetings and had a voice in reaching the decisions in which it was agreed to carry out the work. The safety director then personally follows with each supervisor the status of the work in question so as to keep the matter alive and maintain satisfactory progress in carrying out the work so that completion at an early date is assured. While we work on these items as promptly as possible and clean them up expeditiously, being an average plant we quite often get behind in this work, and, when we do, the matter is brought to our attention by the workmen's committee in no uncertain terms. The minutes of this safety committee meeting are posted on the bulletin boards all over the plant.

We employ a full time doctor and two registered nurses and have a well equipped first aid station. Since January 1, 1947, our medical department has been card indexing all our employees and listing on this card index the number of trips they have made to the doctor's office and the reasons therefore. It has brought to light some very interesting things. While they have been kept only a limited time, from the records that we now have, it shows that about 10 per cent of our employees are responsible for about 50 per cent of our doctor's office business and that if we were to go up to include an additional 10 per cent of our employees, it would account for approximately 90 per cent of our doctor's office business. We are certainly not opposed to having first aid given our employees, because another interesting thing has been that as our frequency rate went down, the number of employees visiting the doctor's office with minor accidents went up.

In case of an accident, an accident report is filled in by the department foreman. We insist on the department foreman making out the report personally and it is never delegated to the clerk in the department. In the accident report, he gives all of the details of the accident. The injured employee is immediately sent to the first aid station for treatment, and a copy of the accident report is sent to both the doctor's office and our superintendent's office.

After medical attention and first aid is administered the injured employee returns to his department, and the foreman makes a thorough and detailed investigation of the accident, its cause and what can be done to prevent a recurrence.

At 8:00 a.m. each day, our safety director makes a permanent record of all accidents of the previous day. Should the injured employee fail to report for work on any of the first three days after his accident, an investigation is made to find the cause of his absence. The foreman of the injured employee also notifies the doctor's office in case of an injured employee failing to report for duty. The purpose of all this is to make sure of the cause for which the injured employee is off. That is, if it is due to the injury received in the accident or for some other cause.

As a result of this check up and the fact that it is known to be made, we have eliminated many one and two day lost time accidents in which the employee is merely seeking an excuse to be absent from work a day or two.

Another important function of our safety director, or in his absence some member of the safety committee is to visit each and every one of the employees who are at work on the regular shift after an accident and inquire as to their welfare. This gives us a personal touch that we consider well worthwhile.

We receive safety posters and bulletins put out by the National Safety Council. We get about 45 monthly. These take care of each bulletin board in our plant. They are kept under glass and changed each month. We make use of these regularly. They have been very helpful in creating interest in safety. In addition, posters from other sources are put up if it is judged they are of sufficient interest.

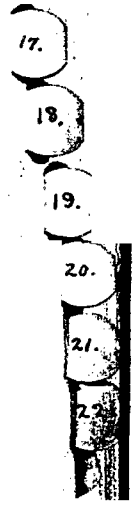
One of the main uses of the display method of creating interest is centered in our safety booth, which is located near the entrance of our plant cafeteria. This booth is under the personal direction of our safety director who takes a lot of pride in it. He is somewhat of an amateur cartoonist and very original in the arrangement of the displays. The display booth is about 3 feet wide by 12 feet long, and gives plenty of room for him to exercise his ingenuity. It is not at all uncommon to find an interested group of employees gathered in front of the display.

Our principal endeavor in the use of posters, bulletins, the arrangements of our safety booth is to keep it current and pertinent. For example, we post on our safety booth the date of the last lost time accident. We also have a comparison of our monthly lost time accidents record both for the current year and the year preceding.

The National Safety Council magazines and pamphlets that we receive are culled for ideas which our safety director uses in preparing posters and arranging his displays. He also gets ideas from the various pamphlets and advertisements put out by the manufacturers of safety equipment. All of these have been of great help in creating employee interest.

To sum up, we have been able to accomplish what we have done in safety work by continually preaching safety to our employees working through the supervisors and through the Union until everyone on our plant understands that safety is a part of his daily duties. While we continue to make our regular monthly inspections, our safety director is given ideas for correction daily by the employees. If the suggestion is worthwhile the employee is given an explanation as to why we do not regard





it necessary and thank him for his co-operation and ask him to continue to keep his eyes open for other unsafe items.

Suggestions for the elimination of safety hazards are handled through our regular suggestion committee, and suitable awards are made for those that are adopted. The plant manager takes active interest in the safety work at the Kansas City plant. Not only this, but he has been successful in selling the safety idea to the heads of the commercial department. He almost invariably touches on safety at meetings with the employees which we conduct at our plant, from time to time. This, coupled with the fact that we have an active safety committee set up and the proper use of bulletin boards and posters, has resulted in a reduction in our frequency rate, so that we expect in 1948 to equal or better our record in 1947. In fact, we are shooting for a frequency rate of around 3.0.

We have found that after the original ideal is started and sufficient people are interested that the thing has a tendency to snowball. In the succeeding years, provided that the interest by everyone is kept up, the results will be increasingly good. As an example, we used to have in the neighborhood of 8 to 14 lost time accidents monthly. If we were to have as few as 5 or 6, we considered that we had an extraordinarily good month. Now, if we have as many as two accidents in one month, we think we have had a very disastrous month. For 1947, we had a total of 27 lost time accidents for the year. In 1944, we had 241 lost time accidents.

You can readily appreciate the effect the reduction of lost time accidents has had on the personal suffering, discomfort and financial troubles of the injured employees and their families. And last, but not least, the savings to Swift & Company.

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## Let's Sell the Safety Engineer to the Boss and the Public

By W. S. HAINES
Manager, Safety and Claims Service, Inc., Chicago

Safety engineers are to be sincerely congratulated on the admirable job they have done in selling themselves and their mission in life to the foreman and workers. With the possible exception of the field of labor relations (in which we play a big part), we are the youngest of the great humanitarian professions. We have done a splendid job in reducing accidents as fast as we have but we have done it almost entirely through contact with our immediate "patients," the factory employees. We have failed in selling ourselves as ourselves to the ultimate controllers of our professional destiny, our bosses and the public.

Let us grant that safety is hard to sell because it is an intangible. Still we have sold it to the foremen and employees. It is high time that we begin to think about devoting some of our foresight, ability and imagination to improving our position in the competitive executive market.

At first the idea of actually looking for ways and means of selling ourselves and our jobs may seem crude. When we analyze it, we find that exactly the opposite is true. We know that a poor talk given by a well-known man attracts more attention than an excellent message by an unknown speaker. Selling ourselves will sell our safety message, and the time has come for us to use every legitimate means of doing this.

Maybe some of you have had something resembling this shocking experience:

I have a friend who owns and operates a successful manufacturing concern employing approximately one hundred people. His brother-in-law is one of those delightful but lazy misfits who cannot quite make the grade. Every effort was made to work him into the organization; first as a salesman and then in a minor production capacity. Six months ago, through my friend's pressure, he landed a job in the personnel department of the Green Company, a much larger plant. Last week my friend came into the office, carefully closed the door, and in a shaky voice said "I'm terribly worried about Pete. You know I've done everything possible to try and fit him into my organization and it can't be done. Now he is going to lose his job at Greens. Before this happens do you think you could get him a job somewhere as a safety engineer?" That hurt, coming from a successful business man.

Other professions ethically sell and re-sell themselves. I've listened for hours on endless hours to top executives talk about the skill of their accountants or the cleverness of their lawyers but except in one instance I have never yet heard an executive voluntarily praise his safety engineer. That's because other older professions sell confidence and optimism, while we are all too prone to sell nothing but pessimism, misery and gloom.

The best place to start our "Sell the Boss" campaign is our periodic safety report. Most of our reports are dry as dust. Our reports must be eye-catching and attention-getting, and that takes both imagination and some writing ability. They must be factual and truthful, but both facts and truth can be stated in different ways. The headline "An Apple a Day Keeps the Doctor Away" is just as "truthful" when it is written "Fruit Growers Spell Doom of Medical Profession."

Let's take an actual example from one of these reports:

| | |
|---|---|
| Plant accident frequency 1946 | 45 |
| Plant accident frequency 1947 | 30 |
| National average for our industry | 22.6 |

Why not make it read "In 1947 we had one third less lost time accidents than in 1946"? Watch the boss smile. It's like chopping five strokes off his golf score. And what's the national average doing in there? He doesn't like to be reminded that he is no Ben Hogan.

And here is another one, a little more subtle:

Tucked away on the bottom of a pile on the boss's desk was an eight page single-spaced report burgeoning with a dozen different kinds of safety statistics. It was a splendid factual report that had taken the safety engineer two and a half weeks to prepare. But it didn't have a cover letter or opening paragraph—nothing to arouse the boss's interest. We had been talking about other matters and as I was leaving he pulled it out, handed it to me and said, "Before you go can you tell me what this means?" He was too courteous to add, "... before I file it."

That was easy. "It means two things, Mr. Smith. You had less accidents and less days lost last year than ever before in the history of your company, and it means that you are in line to win the nationwide safety trophy for your industry." Yet there wasn't a word about those two facts in the whole dull dry mass of statistics.

There was a funny sequel to that. He started to thumb through the report, smiled, and then paused, "It says here that we had an accident frequency of 7.3 and a severity of .13. What does that mean?" I had to confess that I was never quite certain, but I pulled out a paper which I have carefully carried in my wallet for the last fourteen years and read to him, "Frequency—the number of lost time accidents per one million man hours. Severity—the number of days lost per thousand man hours."

He looked blank, and when I offered to read it again he shook his head and turned the page. Severity and frequency may be fine when we are talking among ourselves, but using them in public is like having the doctor tell us there is a marked emphysematous contusion over the outer aspect of the fourth left metacarpal when what we want to know is whether or not the employee broke his hand.

In improving our reports, often we can translate cold dollars and cents accident costs into more compelling units of production mediums. I recall one meeting of superintendents and executives following a particularly stupid and horrible mine accident in which a man had been killed. My talk centered around the direct cost of $8,500 and while I was floundering around trying to bring out the indirect costs with which we are all familiar but which are so hard to put into words, I noticed that the general superintendent was doing arithmetic problems on a piece of scratch paper. He took over the meeting with the statement that the $8,500 I was talking about meant *six and a quarter cents!* I later learned that he was talking about increased cost per ton of ore per annum, and that six and a quarter cents directly charged to each ton was much



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more serious to his audience than my larger but less dramatic figure of $8,500. Try it after your next serious accident. Figure it out at so much per sole or hide or pound and see what happens.

The written body of our reports needs a great deal more dramatizing. On our recommendations we use too much telegraphese, especially where we are asking for an appropriation. "Dept. 26—Mach. 132—*Renew guard*" may tell the story, but "Renew the worn out guard on press 132, department 26 before the operator loses her hand. Cost of new guard, $187.50—estimated cost of hand, $4,562.00" is much more apt to untie the purse strings. The word "before" is important in any recommendation. *Use your imagination. Don't depend* on the boss to use his. He may not have any.

Recommendations can be written so that they carry a punch. I hope you will never want to use it but the best one I have yet seen came out of an employee's suggestion box where the printed blank recommended that the employee go into detail. The suggestion slip, signed by an able machinist, read, "Put a better light over bench 24. I would go into details but I haven't time as I have to read the want ads."

Dramatic writing has a place in the report if it is not used too often. Here is a sentence which got results in the form of disciplinary action after repeated pleas with the foreman and repeated reports about hand trucks being operated at excessive speeds had all failed:

"Three men operate the hand trucks; one on front and two in back pushing. The man in front runs backwards at top speed holding on to the truck, with a sublime indifference to slippery shoes and floors. Truckers throughout this department handle heavily loaded trucks with a gay abandon."

But an even simpler one got faster action from the foreman himself:

"*The shipping department needs no comment.* It looks like a rat's nest."

But our biggest failure in dealing with top management is our failure to deal in futures. We are too much concerned with what has happened, not sufficiently concerned about what will happen. This was admirably brought out by Mr. W. F. Lund, Assistant Treasurer of the Gulf Oil Company in his thought-provoking paper given before the 1947 Greater New York Safety Council entitled "What's Wrong with Safety Engineers." Among other criticisms and suggestions, Mr. Lund had this to say:

"Management today, more than ever, is interested in business forecasts. Analysts study the past, interpret the current trends and attempt to predict the future. The safety engineer has the same opportunity of presenting interest creating material to his executives. However, his periodical reports are not styled to arouse curiosity. They seldom provoke questions. They do not get under the skin of the reader. Too often they consist of a tabulation of statistical data that permits of no discussion. There are no conclusions drawn, no highlighting of pertinent facts and no specific recommendations supported by convincing evidence to improve current trends."

We overlook the fact that the boss has trained himself to disregard past profits and losses, past successes and failures, except for what bearing the past has on the future. What he would like from us is a "Budget For Next Year's Accident Costs." If you have never done it, now is an excellent time to try, because you will find that the last few years have lulled him into a sense of false complacency about this important item in his total budget.

This was driven home the other day when *I talked with the chief safety director* of one of our larger plants. Normally he is a pessimistic individual during working hours, but there he was with his feet on the desk, grinning from ear to ear. He jumped to his feet, grabbed my hand like a long lost brother and exploded. "What do you think has happened to me? Old So-and-so, our tight-fisted treasurer who thinks that the safety department is an unnecessary evil, just walked all the way down here to congratulate me on our having received a 7½ per cent reduction in our compensation rate." My added congratulations were slightly left-handed. "That's fine, Charley. That means that the insurance people figure that your accident costs for next year are only going up 7½ per cent." Charley's jaw fell, but he was honest enough to say, "I don't get it."

Here is the joker:

Charley's workers had just had a 15 per cent pay raise. With a few minor exceptions the compensation rate is applied to the entire amount of wages paid. Consequently when wages are spiralling upward, compensation rates tend to go down. Charley and the treasurer had made the all too common mistake of confusing percentages with dollars and cents cost.



Here is what has happened in Charley's plant. In 1939, before the war, he had a thousand factory employees earning an average of $30.00 per week. This produced a weekly payroll of $30,000. The 1939 compensation rate was $2.00 per $100.00 of payroll and the weekly compensation cost was $600.00. Today his $2.00 compensation rate is down to $1.50 but those same thousand employees are now earning $60.00 per week or twice $30.00 they earned before the war. Consequently the old $30,000 weekly payroll is now $60,000 and the $1.50 compensation rate applied to the new higher payroll produces a weekly compensation cost of $900 as compared with the pre-war cost of $600. In his case the compensation rate had gone down only half as fast as the weekly wage rate had increased, so that the final result was a 50 per cent increase in the cost of compensation per man hour per unit of production.

Then Charley started to get mad at the insurance company. He pointed out that both his frequency and severity were showing satisfactory decreases each year. Any way you looked at it, the insurance company was getting hog rich at his expense. But this is not true either. While his number of accidents and the number of days lost per accident has been going down, he overlooked the fact that the cost of each accident has increased or inflated at about the same rate as everything else.

Now seemed like a good time to jar the treasurer out of his apathy, so Charley started his "Budget For Next Year's Accident Costs." Here are some of the direct expense items he took into consideration:

1. The increased workman's compensation benefits voted by the last session of the state legislature. Most states did this a. will have to do it again. New York, example, went up to $32.00 per week last July 1st.

2. Increased cost of medical care. Hospital rates have gone through the ceiling, but the hospitals are still losing money. Doctors have tried to keep their charges under control, but they still have to buy bread and meat like other less necessary mortals. As for nurses, just try to find a good one at any price.

3. The increasing liberality of the various state compensation laws and industrial commissions. Dermatitis, for example, is becoming increasingly expensive, as most of you have already discovered.

4. The increased average age of workers, due primarily to the seniority clause in the union contract. While it is true that older employees tend to be safer, the cost per injury mounts rapidly after the age of 40. The following table, taken from a single New York State industry, contains too few cases for a true picture, but does give a general idea of what happens:

| *Age Group* | *Average Cost of Last Time Accident* |
|---|---|
| Under 20 | $162 |
| 21-30 | 116 |
| 31-40 | 119 |
| 41-50 | 288 |
| 51-60 | 609 |
| Average all ages | 308 |

Charley concluded his budget forecast with the steps he was planning to take to combat these mounting accident costs and again asked for increased first aid room facilities. This time he got them.

So far we have been talking about direct ways of selling our ideas and ourselves. The advertising people know that there is such a thing as indirect selling or propaganda. We have used it in reaching down to our foremen and workers, but we have failed to realize that publicity, both personal and professional, is essential to the promotion of our careers.

Possibly we instinctively fear publicity. We have learned that bad accidents make news and we do not like this type of news. But there are other types of news which we can have for the asking if we will only learn to ask. The airlines and railroads seek and get subtle safety publicity to help counter-attack the next headline crash. It's news when The Pullman Company operates for a year without killing a passenger or an employee, and it's equally news when our plant in Podunk Falls improves its accident record or operates for a year without lost time.

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Similarly it's news when the small town plant puts in a two-tone painting scheme in the interest of safety. The whole town will be interested in the before and after pictures, provided we remember to take the befores. Get to know your local editor. He will help you find stories because he realizes the news importance of anything that happens inside your plant walls. Incidentally, if you lead him to the story, he will give you the personal publicity which you need.

Those of you who have house organs are singularly blessed publicity-wise. Yet the safety sections of most house organs wouldn't pass a freshman year journalism examination. If you need help in writing them, get it from some newspaper or advertising friend who is trained to write material that the public will read. He will tell you to use names, and lots of them. "Department 26" is impersonal, but "Mike Bolan's Canning Department" means a lot when Mike wins the departmental safety contest. Sign your name to the safety page, or better yet work your name into the safety news article. That is perfectly legitimate free publicity. Don't forget that the house organ is read by everyone, the boss included.

Then there is the whole virgin field of paid publicity. It's called advertising. When your fleet rolls up a commendable record in a given territory, go see the advertising department and tell them about it. You may find that it will result in a full page ad in the local paper. Advertising men know that good safety records help sell products. Jones and Laughlin uses two-page spreads in national magazines to tell its safety story. You have all seen the Studebaker ads with the father and son, wearing their goggles, working safely together at the same bench. Last winter United States Steel Company devoted the entire advertising time on one of its hour-long programs to the story and results of its safety program.

Another excellent medium of safety advertising is the annual stockholders report. The new type report makes it a point to discuss products, labor relations and policies. Safety has a place in this report, particularly if you have a safety record which your stockholders will be proud of. Write up your safety story and take it to the president. Even if he does not use it, he will not overlook the fact that you are trying to sell your department and yourself. He did the same thing on his way up.

If your off-the-job safety campaign goes to the wives and families and into the homes of your employees, be sure that your company officials are on your mailing list. I recently complimented one executive on the family education program being carried out by his safety and welfare department. He did not even know that it was going on. I handed him the last release dealing with safe driving. He read it and remarked, "This is good stuff. I can use it." Then he buzzed for his secretary and asked her to type out a plain envelope and mail it to his wife."

* * * *

DRAMATIZE . . . ADVERTISE . . . FORECAST . . . and SELL.

We have a lot of selling to do. We will never achieve the social and financial compensation which our responsible positions deserve unless we ethically sell ourselves through personality, press and radio to our bosses who control our immediate destinies and to the public which controls our bosses' ultimate destiny.

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# Accident Prevention in South American Packing Plants

By MILTON W. MEYERS
Safety Director, Wilson & Co., Inc., Chicago, Ill.

Wilson & Co., Inc. operates two packing plants in South America: one plant is located in Buenos Aires, Argentina, and the other in Sao Paulo, Brazil. I spent three months at our plant in Buenos Aires, and one month at Sao Paulo. After arriving in Buenos Aires, I made no attempt to launch into a planned program without first getting well acquainted with the foremen and other supervisors, since in our opinion, no program, whether it be safety, or any other subject, has a chance of success without the support of the operating supervisory staff.

We conducted a pilot group for our divisional superintendents in order to expose that level of management first, and attempt to get their suggestions and approval on the program, and after that group was committed, then the course was ready for the supervisors. The sessions were held to one hour meetings, with 12 to 14 supervisors attending each session.

Session one of the course was devoted to an address by the superintendent, introducing the writer to the group and telling the purpose of his trip to South America. This was to put over to the supervisors that this accident prevention program was being sponsored by the local plant management. It also showed that the Chicago Office attached enough importance to accident prevention to send a man 6,000 miles to set up a program, as well as local personnel to follow.

After the superintendent's discussion on the purpose of such a program, solicitation of the backing and full support of the divisional superintendents, the superintendent asked each divisional superintendent to comment and raise any questions in mind and to personally express their support of this program. One of the first questions by the group was whether or not this program was going to be a "one injection affair," or would there be a follow-up and continued support. This was answered by assuring the group that personnel would be set up to work closely with the supervisors in the accident prevention work.

After this first session was over, and the purpose of the program was covered, the second session covered the evidence at hand, showing the need for such a program. We are still convincing and selling the program, and have not put it on a "here it is, you do it this way" basis. To help sell the need for the program, we turned to statistics, and produced and presented charts and graphs to tell the story of our accident experience.

Our charts showed man hours lost, cost of accidents by departments covering all departments in the plant. We also compared our Buenos Aires plant statistics with statistics of our plants in the states. This latter comparison immediately brought out the question "Why is the U. S. record so much better than the South American record?" My answer in short was that accident prevention is first consideration at our plants in the States, and a subject that is being worked at continually just as much as we conduct research on our products to improve them. In other words, accident prevention must be worked at—it doesn't just happen, or run by itself. It's one thing to wave the flag of accident prevention, and it's another thing to have it show up in the way of favorable results in your accident experience.

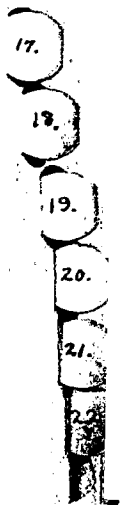
By the end of the second session, we had made considerable progress in selling the program to our supervisors. The third session started off by our putting this question to the supervisors—"What can you men, as supervisors, do about reducing accidents." With this question before the group, we again turned to statistics for help and catalogued the accidents in two categories — plant physical failure and human failure.

Surprisingly as it may seem, the old 85-15 per cent proportion held true. In other words, 85 per cent of the total accidents in our plants in South America were due to human failure (employee failure), and 15 per cent due to plant conditions. This big nut to crack was the 85 per cent, but this did not mean that the 15 per cent was to be ignored entirely. However, as long as supervisors and employees are not accident prevention conscious, accidents would be prevalent even in a physically perfect plant, if there was such a plant.

What could the supervisors do with this 85 per cent figure; well, once again, it's the old selling job all over again. Management sells the supervisors, and the supervisors sell the workers, and after every employee gets behind the program accidents drop to a minimum. The supervisor's part is on the job training of the new worker and the old worker in the safe way to perform his or her duties.

The supervisor must study his employees at work, study their motions of performance and look for the danger points and the exposure to accident areas, and then endeavor to show and guide the worker in the safe way to work. This takes time and follow-up, but in the end, the results will





show up favorably to say nothing of the elimination of personal pain and suffering of the injured worker. The supervisor plants the seed of safety with the worker when he takes time to instruct the worker in the safe way to perform his duties.

Planting the seed is not enough alone, and this is where the local safety councils come into play. After the seed has been planted, it must be watered regularly with posters, awards, movies, meetings, articles in company paper, safety committee follow-up and other aids to help transform this original seed into a living part of each employee at work.

The safety councils of Argentina and Brazil are very able organizations and do play their part in this work of accident prevention as evidenced by the many posters, pamphlets and other articles on display here today. These organizations in South America, of course, have not advanced as has our National Safety Council here in the States so far as having separate industrial departments and personnel to follow and be of assistance to member companies. But then too, South America is 15 to 20 years behind the States. However, their safety organizations are making strides and developing as rapidly as possible.

The Safety Council in Argentina in conjunction with the University of Buenos Aires sponsored a two year course in safety engineering, which brings them right up to the States in the educational phase of accident prevention. Our Buenos Aires plant has two men currently attending this course as employees of our accident prevention staff in Buenos Aires. Our current programs at our plants in South America, as well as our plants in the States is to have the supervisors analyze the employees at work, and be ever alert to remove them from the area of danger.

We have full time safety men set up at our plants in South America who work with plant employee committees investigating ways and means of carrying on an active accident prevention programs and these committees in turn make recommendations to management and follow up their recommendations.

Our plants in South America are also supplied with mesh gloves and other items of safety equipment used in packing plants. Gloves are shipped from the States, knife pouches are made by our machine shop, guards on the knife steel are shipped from the States and then fit to the employee's steel. Shoes are available locally; however, approximately 50 per cent of our workers at our plant in Sao Paulo, Brazil don't wear shoes, and surprisingly enough, we don't have too many foot injuries. Barefoot workers perform slaughter operations on the killing floor, standing in blood. This is one of the mysteries of accident prevention at our plant in Brazil.

## Round Table Discussion of Meat Packing Industry Safety

(A Summary of Remarks)

*Presiding:* R. A. HARSCHNEK, Safety Director, Swift & Co., Chicago.

*Participants:*

Safety Devices

J. POCHOP, John Morrell & Co., Sioux Falls, S. D.

Plant Lighting

P. HOVIND, George A. Hormel & Co., Topeka, Kansas.

Safety Improvements Found Necessary on Equipment Purchased or Leased—Claimed Safe

L. F. SWEET, John Morrell & Co., Topeka, Kansas.

### Safety Devices

No plant is ever 100 per cent safe, and much work is necessary in order to eliminate accidents due to unguarded, ineffectively guarded and improperly guarded equipment.

Mr. Pochop illustrated his talk with samples, photographs and printed matter.

These were the salient points of the talk:

1. An effective, easily-removable arm guard is a necessity. Self-manufactured plastic arm guard was shown. (DuPont's Plasticele)
2. Use simple worded bulletins frequently distributed.
3. Wherever possible knives should be guarded.
4. Newly installed machinery should be closely inspected before use to determine whether the guarding is adequate and effective.
5. Constant vigilance must be used to take advantage of new ideas and to spot hazards that have crept into the plant through changes in operation. To illustrate this point "before and after" photographs were shown. The items mentioned were:
   a. Fencing-around openings in the floor.
   b. Locking device on elevator starting lever.
   c. Dual-control on Buffalo stuffers.
   d. Steam smothering unit in smoke houses.
   e. Hoods for meat grinders.
   f. Hooks for storage of dock-boards.
   g. Guards to prevent falling of drop-off hooks from rail.
   h. Hinged sliding dock boards.



### Plant Lighting

Modern lighting system is essential if a plant is to be safe and productive. To reduce the cost of electricity, Hormel is installing a night pilot light system. This system eliminates the use of batteries of globes in non-working departments. Efficiency of workers is increased by good lighting. Pilot lights are located on all stair wells, elevators, halls and in all freezers.

Control of the pilot light system is in the hands of the watch service.

All burned out globes are replaced at once.

Extension lights and hand tools are restricted to the type using 6 volts instead of 110 volts.

### Safety Improvements Found Necessary on Equipment Purchased or Leased—Claimed Safe

Most equipment that is purchased needs additional guards installed before it is safe to operate. To prove this point, Mr. Sweet showed enlarged photographs (one when equipment was purchased and another when in operation) of the following machinery:

1. Case packing machine (48 cans dog food).
2. Can closing machine (American Can Co.).
3. Allbright-Nell Sausage Mixing Machine.
4. Cyclone fans.
5. Globe silent cutters.
6. Hopper on meat chopper (limit switch).
7. Machines with ineffective guards around belt pinch points.
8. U. S. Slicing Machines (Guards around chain and V-belts).
9. Peters Cartoning Machine.
10. Famco Linkers.

All of these machines, widely used in the packing industry, needed additional guards on chain drives, pinch points, V-belts, knives, etc.

MR. MAHAN [Hunter Packing Co.]: We use quick opening valves on our steam smothering system.

MR. H. E. GAVEY [Swift & Co.]: Has anything been done to encourage equipment manufacturers to safeguard their machinery?

MR. MAHAN: The St. Louis Safety Council is working on this problem.

MR. GAVEY: We have recently had an accident where a man caught his fingers between the first roller and the bar that controls the rate of entry of the cases into the sealer. We solved this problem by removing the first two rollers.

MR. MAHAN: We use six volt hand battery tools, instead of using six volts cut down from 110 volts, and they prove satisfactory, although short lived.

MR. J. EHARDT [Swift & Co.]: What intensity does Hormel use in their pilot lighting system?

MR. HOVIND: No particular intensity.

MR. H. D. TEFFT [American Meat Institute]: Are low voltages always safe to use?

MR. M. CERNETISCH [John Morrell & Co.]: Voltage plays very little part in electrical injury. It is voltage plus amperage that does the damage.

MR. W. MASSY [Plankinton Packing Co.]: Mr. Sweet, are the limit switches used on the hopper covers of your grinders protected in any way?

MR. SWEET: No, we make no attempt to hide our limit switch.

MR. MASSY: In order to protect our limit switches from water we put the switch

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on the ceiling and connect it to the hopper by cable.

MR. R. A. HARSCHNEK [Swift & Co.]: It is also possible to use a micro-switch to prevent worker contacting worm that is coasting.

MR. MAHAN: We had a man injure his head in a stomach washer on which the limit switch was damaged by water. Now, we use waterproof limit switches. They prove effective.

MR. TEFFT: Mr. Hovind, in case of power failure are your freezers plunged into darkness?

MR. HOVIND: No, in case of power failure our pilot light system would still be in operation. Pilot lights in freezers and coolers are located alongside the regular light switches.

MR. V. YEHLING [Swift & Co.]: Has any one developed a satisfactory guard for the *Townshend Skinning Machine*?

MR. GAVEY: The operating pedal on the Townshend should be as low as possible so that the operator does not have to raise his foot too high. Many accidents occur because operators become overbalanced and fall against machines.

MR. CERNETISCH: In order to prevent injuries to heels of employees, caused by contact with the standards on 2-wheel buggy trucks, why can't the manufacturers move the standards farther apart?

MR. GAVEY: From experience we know that increasing the distance between standards does not eliminate heel accidents.

(There followed a short discussion of guarding head splitters and the consensus of opinion was that a satisfactory guard for this machine still must be developed.)

## Round Table Discussion of Tanning and Leather Industries Safety

**(A Summary of Remarks)**

*Presiding:* FRED OTTING, Superintendent, Western Leather Co., Milwaukee, Wis.

**Off the Job Safety**

MILLER HUNTER, Safety Director, General Shoe Corporation, Nashville, Tenn. (Presented General Shoe's approach by promoting the community safety rally. This really dynamic program costs practically nothing. This program could be used by a lot of tanners as it is ideally suited to the smaller community and is excellent for industrial and public relations.)

H. W. HAUS, Safety Engineer, Newberry Plant, Armour Leather Company, Williamsport, Pa. (Presented material on (1) safety air cylinder control on whole hide unhairing machine, (2) bleach wringer motor control, and (3) lime burns.)

**Good Housekeeping**

C. R. BROMAN, Personnel Director, Ottawa Leather Company, Grand Haven, Mich. (Presented the program of good housekeeping as applied at the Ottawa Leather Company plant.)

**Posters and Visual Aids**

JOHN N. RUSSO, Safety Director, Allied Kid Company, Wilmington, Del.

MR. RUSSO: A few weeks ago President Truman called a National Conference on Industrial Safety. The Conferences' overall goal: to find a way to eliminate the waste in dollars and human suffering caused by work injuries. The scope of the project outlined by this conference is suggested by the names of the seven committees that have been put to work:

1. Programs and Services
2. Research
3. Analysis and Use of Accident Records
4. Engineering
5. Laws and Regulations
6. Labor-Management Cooperation
7. Education for Safety.

Certainly if the people who run our country are concerned about eliminating the waste and human suffering, then we who are responsible for running, directly or indirectly, our tanneries should also be concerned.

How should we, as individuals, be concerned? When I accepted a nomination on the *Poster Committee* of the Meat Packers and Tanners' Section of the National Safety Council, I stated that it was a great disappointment to me that the tanning industry was running way behind in frequency and severity record as compared to other industries such as chemical, automotive, rubber, petroleum, to name only a few. Our records seem to get steadily worse by comparison. We are an old industry by birth and operation! We shoud pride ourselves in our importance and contribution to our way of life.

I believe in most cases a successful safety program is the yardstick of a successful business. It is a well-known fact that insurance underwriters who carry workmen's compensation in some tanneries can't even get their foot in the front door to make recommendations as to what might be done to improve the safety program within the plant.

The following constitutes a well rounded safety program.

1. Accident analysis and investigation
   (a) We must know what accidents happen and why.
2. Establishing objectives
   (a) Our main objective is to reduce the number of accidents now occuring.
3. Preventive measures of known causes
   (a) Guarding machinery
   (b) Providing proper equipment and special type of work clothes
   (c) Eliminating poor housekeeping
   (d) Foremen should have brief safety meetings once a month with his employees.
4. Hazard elimination
5. Accident publicizing
6. Safety meetings.

Some progress has been made in the safeguarding of buffing machines and shaving machines. Many other types of machines go unprotected or else the guards are of no value at all. We should work more closely with the men who make these glazing, staking, buffing, shaving machines and presses and tell them before the machines leave the makers the importance of designing and installing guards prior to their getting to our tanneries.

*Posters*—In the field of posters and visual aids the amount of work that has been done and the research that might be done has untold possibilities. For instance, more humorous posters should be developed.

The subject should not be made to appear ridiculous. Everybody reads comics and not all comics are meant to be comical. Many are instructive and educational. Our tanning posters could be presented in such a way as to make our people want to read them? How can this be accomplished? We can study the control records which we keep to determine where the greatest concentrations should be made.

After an analysis is made pictures might be taken of specific operations, for example: you might be having several "thumb pinches" from the glazing machine. A picture of this particular operation could be taken and forwarded to Bill Davis our staff representative at the National Safety Council and in turn these could be turned over to the staff artists who would then get some idea of what a staking, toggling, or embossing machine looks like.

*Visual Aids*—In this field of our educational program as far as I know there is absolutely nothing available! There are several films that might be used in safety in tanning. But when an individual has to wonder how a picture could be applied to his particular job, then the picture, to my way of thinking, has no value. We should begin thinking of making a safety film on a series of slides which could be accompanied by a recorded narration. The same as has been done in the other industries. I have shown almost every general type of film that could be gotten to our people and none of them show you what the inside of a tannery looks like. For several years I have suggested to our underwriters that they make a safety film on tanning only to have my ideas fall on deaf ears. Our company has a complete motion picture machine and projector for training films of this sort. However, for those companies who are not sold on such an investment—the local safety council offices are more than willing to furnish films, machine, projector and operator only for the asking. This is what we did before we invested any money in education for safety.



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# *Officers of the*
# Meat Packing, Tanning & Leather Products Section
## NATIONAL SAFETY COUNCIL 1948-49

*General Chairman*—MARTIN CERNETISCH, Safety Director, John Morrell & Company, Ottumwa, Iowa.

*Vice-Chairman* (Meat Packers)—R. A. HARSCHNEK, Safety Director, Swift & Company, U. S. Yards, Chicago, Ill.

*Vice-Chairman* (Tanners)—C. R. BROMAN, Personnel Director, Eagle-Ottawa Leather Company, Grand Haven, Mich.

*Vice-Chairman* (Leather Products)—H. L. CLOVER, Safety Engineer, International Shoe Company, St. Louis, Mo.

*Secretary*—ARTHUR SCHMUHL, Safety Director, Wilson & Company, Chicago, Ill.

*News Letter Editor*—MILLER Y. HUNTER, Safety Director, General Shoe Corporation, Nashville, Tenn.

*News Letter Co-Editor*—JOSEPH POCHOP, Safety Director, John Morrell & Company, Sioux Falls, S. D.

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**Current Safety Topics in the**

# METALS INDUSTRY

**As presented in the Metals Sessions of the 1948 National Safety Congress**


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**Volume 17**
**Transactions**
**1948 National Safety Congress**

GREEN CROSS FOR SAFETY

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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE METALS SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Metals Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Metals Section carries on in behalf of its members, and for the benefit of accident prevention work in the metals industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of metals plants. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on pages 30 and 31 of this volume.

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# Presentation of Awards

*(A summary of remarks)*

By W. H. CAMERON

Honorary Member, National Safety Council

Mr. Cameron reminded the members and guests of the section that their officers and committees had assumed two responsibilities in conducting this public ceremony. The first one was to emphasize that they had come together to publicly pay tribute, and offer just praise, to all of the contestants, and particularly to those winners in the several classifications.

Praise is a necessity to all human beings. No sort of human society has ever been found in which there were no honors and ranks. Furthermore, one of the twelve principles of efficiency, as promulgated by Harrington Emerson, was "rewards." We have learned that men work for money, but for praise they die. The winners in this contest have the right to praise, and to be publicly reminded that their victories are an asset to the metals industry, and they are also deserving of the congratulations of the National Safety Council's membership, and, in fact of every citizen of our country.

The winners were also reminded of the assertions made at a similar ceremonial at the 1947 Congress; namely, that the greatest contribution any employer can make to the national safety movement is to prove to everybody that accidents can be practically stopped and this record maintained year after year. Contests of this character are believed to be the outstanding accomplishment in the effort to reduce to a minimum the number of accidents in any one company's operations.

As a reminder of discoveries made twenty-five years ago by Dr. Lucian W. Chaney, who studied the accident experience of the steel industry over a period of ten years, Mr. Cameron quoted the following paragraphs from his 700 page reports: "Human carefulness probably cannot be speedily perfected, but physical conditions very possibly can be perfected to a point making serious accidents a very rare occurrence." Another paragraph: "It is quite practicable to make industry so safe that fatal accidents and other serious accidents will be of exceptional occurrence." It may be said that if personal carelessness could be entirely eliminated the effect upon the number of fatal and serious accidents would not be great so long as the engineering defects are left unchanged. Dr. Chaney's outstanding discovery was "That engineering revision is intended to suggest the widest application of engineering skill to industrial plants."

Mr. Cameron also noted that last year the best safety record of the steel industry was made. This, too, was the steel industry's greatest peacetime production year. The frequency rate was held to a lower rate than in any previous year with reference to hours of work. The industry was the third lowest in accident frequency among 40 major industries. Its record was 50 per cent better than the average of all industries combined. Only the communications and electrical equipment industries had lower frequency rates. Six hundred and fifty-six companies completed the contest. Forty-three companies completed the year without having a reportable injury. One hundred and seventy-four companies are winners of "reduction award certificates." There was a 14 per cent reduction in frequency rates in the contest year between July 1st, 1947, and June 30, 1948.

# Safety—A Dead End Street?

By V. H. LAWRENCE

Vice President, Jones & Laughlin Steel Corp., Pittsburgh, Pa.

What could I say to you about your profession? I, a man whose basic training qualifies him with almost complete ignorance of the details of your technical profession?

In worrying about a subject I went back to an old attack—when your ingenuity fails you can go back on past experience in similar situations and perhaps find an answer, and this I did.

Back 15 or 18 years ago I remember attending an Open Hearth Conference of the AIME. We steel men were addressed by a man probably as ignorant of our profession as I am of yours. He was, as I remember, a chemist from the oil industry. He made a talk that I still remember 15 or 18 years later. He made this impression on me by throwing stones at our profession, and some of those stones were sharp enough to hurt! He criticized, as I remember it, our chemical procedure.

He said of our chemistry, and you steelworkers will enjoy this, that it probably approached rock bottom in being inane.

He pointed out that we take iron ore (an oxide of iron) into our plants with the intention of making steel out of it. We charge this iron ore into our blast furnaces to eliminate the contaminating oxygen by "reducing" it with carbon. When we finish this operation we have eliminated the oxygen, but we have an excess of somewhere over four per cent carbon that we do not want. So we then transfer this contaminated steel to our open hearth and eliminate the excess carbon with more iron oxide. Nine or ten hours after we started we have a molten bath, now free of this excess carbon but again containing an excess of oxygen, not quite so high—.07 to .15 per cent. We then eliminate this excess oxygen by reboiling our heat with pig iron or silica pig. Even then we're not able to accomplish our objective. We have to go outside our own industry and use notch bar aluminum to finally eliminate the impurities by creating objectionable entrapped "dirt" in the form of alumina.

In other words, we have swung like a pendulum from an excess of oxygen to an excess of carbon to an excess of oxygen; to undesired carbon; and to alumina contamination, before attaining our objective.

If our application of chemical principles smelled bad, that part of the operation which we are supposed to know best (the melting of steel), "stunk." He compared our open hearth melting in thermal efficiency with trying to boil a saucer of water by holding a lighted candle over the top. He pointed out that, ridiculous as this is, we further complicate it by introducing six or seven inches of a good insulator (in our case, slag) between the liquid we are trying to heat and the flame we are trying to heat it with.

Remembering all of this, this method of attack appealed to me and I decided to follow the same technique, a good safe one for an outsider to employ. I would jot down and arrange in logical order all the things I saw wrong with the safety profession. This was an easy solution—until I started to do it.

When I was operating, I had plenty of minor gripes with the safety men, but when I started to write them down, too many of them exploded in my face.

Enthusiasm? In a profession like the steel industry, where four steel workers can't get together to play bridge without spending most of the evening talking about their work, is the safety man equally enthusiastic? Yes, I would say the safety men are outstanding in their almost religious fervor for their profession and their practices.

Do they take the easy road through most of their problems? I can answer that. It might be an interesting challenge to some of the operators to suggest that they take the unpleasant job of notifying a family in the middle of the night that their husband and father had been killed or severely injured at the plant and see if they "pull their rank" to avoid an unpleasant assignment. But the safety man does it.

Is it a fact that the safety men do not know their business well enough? In the few years that safety has been a separate function of industry, you have built almost a science out of a profession in which you had no historic background. I think we can credit you with both creating and knowing your profession.

Is it because you have been poor organizers? I know of no group that has set up either an internal or an external organization for passing on information as well as you safety men.

In your fervor for your own profession, haven't you lost sight of the fact that there are other objectives besides the end immediately sought? If all the good qualities I have mentioned are valid, why haven't they been recognized? Why haven't safety men been transferred to broader administrative duties?

There emerges the weak point of your



profession. You know and love your job too well to make a deliberate effort to leave it for higher ranking administrative positions. You have let the urge to attain the immediate ambitions of your profession blind you and your ranking officers to the fact that the attributes which have made you outstanding in safety work are the very qualities they want and need in the executive management of their businesses.

My experience has been that the policy-making executives (chairman of the board, president, vice president members of the board, plant managers) of most manufacturing corporations are drawn from men whose basic training has been in operations, in sales, in accounting, in metallurgy, in engineering, in law, in finance; but that men whose primary background has been *safety* are noticeably absent from those ranks.

Yet your profession is old enough industrially, compared with ferrous metallurgy or industrial engineering, to have provided a respectable share of this "top brass."

This casts a serious reflection on you as individuals and on your profession. You should be up there dictating and guiding policy, not administering policy set by individuals who are less capable than you to view broad humanitarian principles.

I don't mean that these policy-making executives are all anti-social or antagonistic to what you are doing. Many of them are just as fervently anxious to guide their company to a good safety record as you are. A few of them, like Admiral Moreell at our shop, are personally just as zealous and just as aggressively humanitarian as any of you. All of them, I think, believe in safety—just as they are in favor of mother love and against the man-eating shark. But they aren't technically skilled except by hearsay in the background, the machinery, and the past practices of your profession.

And you and your predecessors are not in that group. You should be. Why aren't you?

First of all, is this due to the fact that there are no openings coming up? Definitely no!

When I went to work at Alan Wood in 1926 I was the cub department head—both in age and seniority. I was shocked to find when I left in 1941 to go to the Otis Steel Company, that I was the "old man" of the crowd. In 15 years I had outlasted five presidents, three operating vice presidents, five open hearth superintendents, three blooming mill superintendents, four blast furnace superintendents, four chief metallurgists, and two safety directors. In the last week of my term there I jotted down the turnover in the department heads and found it averaged about one turnover every four years.

I have checked that figure again at J&L, and I have found J&L large enough and typical enough to be fairly representative of the industry. The tenure of office of the operating heads of our plants has been four and one-half years at Pittsburgh, and three years at Aliquippa and Otis. Our presidents have averaged just a little over three years in office.

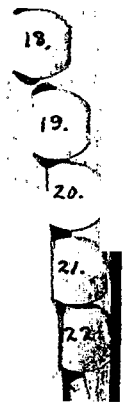
I believe these "law of average" figures. In fact, I am so confident of them that when I took over the operation of J&L's Otis Works in June, 1942, I said in my first supervisors' meeting that I would be out of the way in five years and I wanted three successors ready. The boys reminded me of this four years and nine months later when they had a good-by party for me.

I am so confident that the turnover in the upper level jobs averages somewhere close to every four years, that I would be willing to put that down as an accepted fact. If you can subscribe to it, it certainly means that openings up above are going to be available. If you are 45 years old it is probable that the presidency of your company will be vacant four times before you are too old to be considered a candidate.

In spite of these vacancies occurring in the jobs I feel you should be holding, you are not getting them. Why not?

Is the competition too tough?

Before we talk about the competition, let me rather ruthlessly wash out a few of you from active competition. If you are over 60 and ranked as a safety director or one of his subordinates, you shouldn't aspire to the presidency. The time is too short and between your age and the age your directors will want for their next president and the choice of command too long for anything but mass catastrophe or a well-located favorite uncle to put you in line.



Would you youngsters settle for a plant manager's job instead?

Now let's talk about the competition for you younger men. Russ Greenly has tried to find out just what manner of men this competition is. Knowing that, gives us a pretty good picture of how tough they will be to compete with.

Russ has made a survey of some 2,000 supervisors at J&L.—certainly a large enough group to be representative of the odds you face. These 2,000 men are all, presumably, at least open to the idea that they are eligible for these policy-making jobs I want you to point for. Probably 99 per cent of them feel that they could handle these jobs better than they are now being handled.

In our Corporation there are 20 such jobs. *There is a president, eight members* of the executive committee, six other directors, and five general superintendents of our five big plants. This group makes policy that I feel you should be helping to make.

J&L, maybe somewhat more than most companies, draws these men from its ranks. Of the nine members of the executive committee, eight of us work here exclusively. Obviously the same is true of our general superintendents and largely true of the rest of our board.

With 2,000 men angling for these jobs, the odds are almost exactly one in 100 of any one of these boys making it.

But wait a minute—let's look at their chances. Fortunately we are a pretty young organization, but even so 105 of us are over 60 and probably no longer eligible for these top jobs on that account.

The average age of these boys is 45.9, say 46. By straight actuarial experience another 115 of them are going to quit, seeing greener pastures somewhere else. Twenty-five are going to drop out through physical disability, and 250 are going to die before they reach 60. The fact that this average supervisor is a little pot-bellied may account for the somewhat low life expectancy.

Five hundred of the 2,000 are now automatically eliminated. With a careful regard for your physical fitness, and by paying attention to the things you teach—like not stepping in front of speeding automobiles—you should still be here and available.

Now look at the remaining active competition of 1,500 men for these 20 jobs. Let's talk a little bit about a ticklish subject—education. In our company we don't make a fetish of college educations. Actually, of the 20 policy-making individuals, about 60 per cent have college degrees. But they are all high school graduates. Most of you boys are too. Of these 1,500 supervisors that you are competing with for top jobs, 41 per cent or 615 quit school before they finished high school. These boys may be excellent craftsmen and inspiring front-line supervisors, but as competition for the top policy-making jobs (and this may sound harsh) we can pretty well wash them out.

That leaves 885 still in the running for 20 jobs; one in 45 is pretty sure to get under the wire.

One further educational factor stands out, which I'm not able to account for or willing to guarantee, but which seems startlingly significant. Of these 20 men in what I call the "top brass" in our company, all but one has taken some formal course of study since graduation from high school. Some of them whose formal education was interrupted by World War I went back to college, either days or nights, to pick up special subjects. Some took correspondence school courses; some availed themselves of specialized instruction offered in their vicinity—Penn State Extension for instance.

It would be hard to say that this further formal study for self-improvement was responsible for their promotion into this policy-making group. Walter Duplex's night school studies in advanced accounting undoubtedly hastened his advancement to vice president and controller. There is little doubt that Bill Elliott's taking ferrous metallurgy at Case has been a practical help in his position as General Superintendent at Otis.

On the other hand, Admiral Morrell's work in advanced reinforced concrete design, while hardly a prerequisite for the presidency of J&L, did lead to his being sent to France to study further advanced engineering, then to his being appointed as the youngest vice admiral in the Navy, and then to the fact that he became the only non-Annapolis man to be a full admiral, and ultimately to his election as president of the Turner Construction Company, from which he came to J&L.



A correspondence course I took from Professor Boyleston of Case in metallography is far removed from my present assignment in employee and public relations. I would have equal difficulty in seeing where another course I took in nuclear physics at Penn State Graduate School contributed much to my present job.

But there is something more than coincidence in the fact that 19 out of 20 men who have made the grade to executive positions at J&L did something specific about their "book-learning" after they left high school. Maybe it is only an indication of an inquisitive mind, more probably it is the result of an inherent drive to go further, but in any case, the preponderance of examples in our company must have some significance.

Compared to the experience of this "top brass," however, is the fact that only 14½ per cent of the supervisors we have surveyed have taken night school, extension, I.C.S., Alexander Hamilton, or similar courses. Twenty-two and six-tenths per cent have had some college work.

I will grant that this is not easy to do after these men are working on the job. They put in long hours at the mill, and when they get home their evenings are somewhat cluttered up by their 2.1 children.

If we were willing to assume for a long shot that the study habits of J&L supervisors is typical, and that you have done or are willing to do the same kind of studying, and that the competition has not, this 885 active competitors would drop to just over 300.

Now what have I said statistically?

1. That if you are 45 years old and have finished high school and work in an organization the size and set-up of J&L, by the law of averages sixty-five to seventy policy-making jobs (president, vice president, member of the board, or plant manager) will be vacated before you retire.

2. That if your competition for these vacancies as they occur is now 2,000 men, and if you *set* your mind and energies on getting one of these policy making jobs, your really active competition is only 300, or one in four.

Now let's see what breaks you may have to narrow these odds still further:

If you are a big man physically it looks like a break in your favor. This policy-making group of ours averages just under six feet. The average of the 2,000 supervisors is just a little over five feet eight inches. Why this should be true, I do not know, unless you have to be a big horse to live long enough to get one of these jobs.

If your parents have provided you with the break of better than a high school education the odds are in your favor. While this is not a must, further training definitely increases your chances.

If you have been or are willing to broaden your education and mental agility by formal extra curricular study, you have something more than the technical value of that formal study.

If you keep up your contacts and your knowledge of what's going on in the industry you have created a background that few of your competitors have. These men have been isolated for an average of 12 years by the intricacies of their own jobs. Only 34 per cent of them have worked anywhere else than the corporation they are now working for. They have little opportunity for visiting other plants and talking with representatives of other organizations. You have that opportunity.

Finally, if you actively aim for one of these executive spots you are a lot closer to it than the men who confine their enthusiasm to occasional wishful thinking. This last point may shock you. For some reason, openly and avowedly pointing for an executive job five or six steps up the occupational ladder from where you are now has in the past been hushed up like B.O. or smelly feet.

There is nothing selfish now in aiming for a top job. I feel you can definitely point for it—for one purpose and one purpose only. You owe it to your profession. Safety policies, safety organizations, expenditures for safety, hearty cooperation in safety drives—all will gain momentum if they originate and are pushed from this top group.

You are engaged in a crusade, a crusade to keep those men and families dependent upon you, whole and healthy and alive. You have achieved marvels in the work you have done. You have reached a point where continued improvement at the same rate is

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going to be much harder. It is going to be much tougher to cut your severity from two to one than it was years ago to cut it from ten to four. You can't do it alone. You will have difficulty doing it with untrained and intermitten support from above. You can't do it if you are hampered by purse-string controls from above. Only when enough of you men sit in your companies' councils of policy to insist that your viewpoint color every decision, can your crusade become not a spearhead drive toward a short-time goal, but the fundamental business ethics of your company and your industry. You, and you largely, have got to sit as one of the executive group of your company if you're going to sell and resell what Admiral Morrell sells at J&L: "If we can't afford safety, we can't afford to be in business."

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# "Safety First" Design in Power Trucks and Tractors

By THOMAS N. PARLON
Associate Director of Field Activities, The Yale & Towne Manufacturing Co., Philadelphia, Pa.

According to the National Safety Council, 25 per cent of compensable *industrial* accidents result from handling materials. This percentage is higher than that caused by any other accident source. But the figure isn't at all surprising because a large part of all industrial operations consists of handling *materials*. I read just recently that 25 per cent of all productive labor is engaged in handling materials. And speaking of industry in general, it is said that of all the material under roof undergoing production operations, 80 per cent is either in transit or in storage at one time. Only 20 per cent is in the *actual* process of manufacture.

The danger to men and materials in industry is very real wherever handling has to be done, whether manually or by machine. In too many cases, the need for safety is recognized *after* the damage is done. The important thing is to have the vision to take preventive measures *before* the accident occurs.

Safety has many sides to it insofar as material handling machines and their use are concerned. First, from the standpoint of the safety that is engineered into this type of equipment by the manufacturer. Second, the kind of educational job done when men are first trained to operate the machines—and from then on. Third, the safeguards provided by the company in the plant itself along the routes of travel.

I am going to confine my remarks largely to the safeguards Yale builds into its equipment. But regardless of present or future improvements in truck design and manufacture, no truck can ever be safer than the man who operates it. Operators should be carefully selected and thoroughly trained before they are permitted to run power trucks.

Statistics released by some sources make it appear at first glance that trucks are not as safe now as formerly. As a matter of fact, no forward-looking company would be satisfied with a product today that wasn't better and safer than the one it made years ago. You aren't; and I know that Yale works with customers and with associations in the material handling machinery industry on problems involving safe construction of trucks and tractors. It's a never-ending job, and we are continually striving to find practical ways to create new safety devices and features.

According to the National Safety Council, during the past 17 years the frequency and severity of accidents has declined. In 1946 the frequency and severity rates were 53 per cent and 46 per cent lower, respectively, than in 1930. I feel confident that the increased use of material handling machinery over that period had a lot to do with cutting the occupational injury rate.

In *all industry* only 6 per cent of all *fatal* and permanent total disabilities are caused when handling objects. Permanent disabilities jump to 21 per cent and temporary total disabilities step up to 25 per cent. But it is significant that the National Safety Council points out *that insufficient help and failure to use mechanical equipment when needed causes 11.5 per cent of the accidents.* Here indeed is a factor in favor of mechanization of handling.



The increased use of power trucks and tractors has reduced the amount of material *handled manually* by a great percentage. And in doing this, it has wiped out a lot of the hazards that go along with piece-by-piece "muscle moving." At the same time the application of power trucks and tractors contributed to reduced insurance rates.

It is to the credit of the producers of material handling machinery that they "design for safety" even if it means sacrificing a sales feature. They know only too well that while a special feature may make a sale easier, if the truck isn't safe to operate, there's trouble ahead—and no one benefits.

As you can well imagine, the stability factor for high lift trucks is more important than anything else when thinking of load safety as well as operator safety. We build a stability ratio of seven to one into such trucks. This means that the combined center of gravity of the load plus the truck is a distance from the floor not greater than seven times a base formed by one-half the mean wheel tread. Wide spaced wheels make for maximum stability.

Let's take the stability factor of the fork truck as an example. In designing this type of truck, the placement of the wheels in relation to the overhanging load is highly significant, particularly when you must allow for overloading and picking up the load off center by a careless operator.

If the combined center of gravity of the truck and the load were improperly located, merely applying the brake could overturn the truck. The nearer the center of gravity approaches the center of the wheel base, the more stable the truck will be fore and aft.

Also, by keeping the center of gravity of the truck as low as possible, higher lifts of loads are practical without having the combined center of gravity of the truck and the load exceed the seven to one ratio. The wheel base is designed with more than ample safety factor to take care of plenty of overload and high stacking.

Thus, in this type of power truck, dead weight, wheel base, stability, traction and many other factors must be in the correct place and proportion to insure safe truck operation. Each truck is designed for its "inch capacity load" with an extra factor of safety built into every part that will be subjected to stresses and strains in actual everyday service.

When it comes to crane trucks, we figure their rated capacity should not exceed 80 per cent of the moment required to overturn the crane.

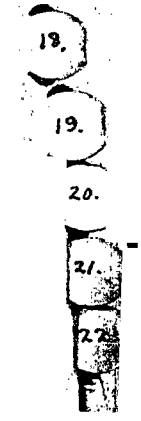
Power truck control equipment, motors, wiring and resistors are enclosed or guarded so that sparks or hot metal resulting from overloads or other abuse will not drop on the floor and thus create a hazard. In this connection, when we know a truck is to operate in a hazardous location where vapors, gases, organic dusts, etc., are present, we treat it as a specialized application and meet the specific requirements for the class of hazard involved.

Aside from stability, the most important safety feature of Yale power trucks and tractors is the interlocking control equipment. If for any reason the truck operator should jump or fall, the foot pedals disengage, the truck brakes go on, and the current is automatically cut off. The truck cannot move when the pedals are up—which means when the operator is not standing on them. In addition, when the driving brake is applied by the operator, under normal operating conditions, the electrical circuit is broken instantly.

The Yale Cam-o-tactor control, with lifetime magnetic throwout on all travel speeds, is designed so that the contacts cannot stick and cause the truck to get out of control. Incidentally, right now in our general safety program, consideration is being given to a safety ignition lock, key operated, to prevent unauthorized use of trucks. So you can see that this interlocking of controls makes the operation of the trucks and tractors as safe as engineering ingenuity knows how.

Wherever the operation of a fork truck exposes the operator to danger from falling objects, the truck can be equipped with a strong canopy guard with openings no larger than the smallest parcel carried. In most applications this addition is not necessary, but we have installed it where conditions indicated the need for this extra safety feature.

Fork trucks are sometimes required to handle small objects or unstable loads on



pallets. To prevent any part of the load from falling toward the truck when the mast is tilted back as far as it will go, a backrest or backguard is available. The same attention is paid to the size of the openings of the backrest as in the case of the canopy guard.

When it comes to attaching the forks to the carriage, we provide a locking arrangement so that the toe cannot be lifted unintentionally where such lifting may create a hazard. Based on the elastic limit of the material, we provide a fork safety factor of at least 3 to 1 as protection against overloading. In addition, the forks are adjustable sideways to fit the physical characteristics of the load and to provide the greatest possible stability in lift and travel.

While it may not seem very important to the layman that special attention is paid to the forks, such attention proves its value in safer operation. For example, because the forks are set at just the right tilt, loads are carried safely when the truck travels over rough floors and roads or on steep ramps. As an extra precaution, a tilt controller with automatic throw out operates when maximum tilt is reached in either direction.

The forks are heat-treated forged steel and maximum use of heavy, alloy steels is made throughout in truck construction.

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To prevent the load from being raised too high and tipping over, or lowered too low, another mechanical throwout is provided. This safety limit stop can be preset so that the load will be lifted or lowered to the desired height without danger of spilling loads or crashing into plant fixtures. This feature is especially important where ceilings are low, or where obstructions are on the floor.

Wherever possible and practical, moving parts such as hoist chains, cables, etc., located within the reach of the truck driver are shielded with suitable guards. Two roller chains are provided, one on either side of the uprights or mast. If one of these chains should break, the other is strong enough to carry the full weight of the load.

If some obstacle hinders the downward movement of the carriage, a free-wheeling device or over-riding clutch in the final drive gear protects the entire mechanism against damage.

We put a horn on every power truck and tractor except those guided by a walking operator. But whether it's a horn, a whistle or a gong, the main thing safety-wise is that the device must be heard clearly above the normal industrial noises in the plant or wherever the truck is operated.

Some industrial power trucks are operated from an end platform. The pedal position is equipped with a heavy steel bumper guard of proper height not only to protect the operator in case of collision but to permit him to step off the truck in a hurry in case of upset or other situation. Fork and rana trucks these days are designed with center control to give maximum truck stability and a clear view and better protection for the operator.

As you know, if road shock is transmitted to the steering mechanism to any great extent, there is danger of the operator losing control of the truck. A good, everyday example of this is the shock transmitted to the steering wheel of an automobile when a bump in the road is hit. In designing the steering mechanism of a power truck, we take advantage of every practical means to minimize such shock. In addition, when a knob is put on a truck steering wheel, we use the mushroom type because this shape fits the palm of the operator's hand better and helps to give him better steering control.

Trucks operated from an end platform usually have a steering handle instead of a wheel. To protect the operator's hands against injury from walls, columns, swinging doors and so on, we put a guard on the handle.

Much thought has been and is still being given to safe operating speeds for power trucks. At present they are designed to travel at five to six miles per hour without a load and at four to five miles per hour with a load. This is faster than normal walking speed, yet it is slow enough to provide maximum control of the truck and protection for the load and the operator.

While improper or neglect of lubrication may not seem important from the standpoint of safety, just remember that an unlubricated or insufficiently lubricated part quickly wears, becomes brittle and gives up the ghost, leaving only trouble, delays and expense. Our trucks are equipped with automotive-type high-pressure lubrication fittings so that all working parts can be kept operating smoothly at all times.



You've seen and heard a lot about color schemes for plants as an aid to safety and greater efficiency. Yale put a lot of time and effort into color research. Some companies don't like to have their trucks painted orange. They repaint after we deliver. But they always come back to orange after a while. Do you know why? The answer is high visibility. Orange is a caution color and high visibility means greater safety.

Even the wheels are of safe, solid rubber-tired construction with extra-wide tread and are so placed as to insure sufficient road friction for safe steering. Truck tires of the non-skid type can be provided where plant operating conditions and type of road surface indicate the need for them.

It goes without saying that the same effort, system and machines that make the handling of goods more economical also make it safer. For, in handling, as in other work, the right way is the safe way. As examples of safe power truck operation, let me give you a brief list of some of the things we point out in our general rules:

1. Permit only authorized drivers on trucks.
2. Never permit any riders on trucks, tractors or trailers.
3. Check the operation of the truck before going on duty.
4. Use the right truck for the job.
5. Never overload the equipment.
6. Use the horn judiciously.
7. Keep to the right whenever possible.
8. Obey all traffic signs—stop at all main aisles, doorways, elevators.
9. Observe the rights of pedestrians.
10. Face in the direction of travel.
11. Avoid sudden stops.
12. Stop the truck before reversing the control levers. Make sure of a clear runway.
13. Drive slowly over ramps, railroad tracks, bridges, rough pavement and in tunnels.
14. Turn corners at slow speeds.
15. Transport and stack only safe loads. Make sure of their stability.
16. Keep the load size or bulk down to permit full visibility.
17. Use only skid bins, skids and pallets that are in good repair.
18. Report any equipment defect, accident or spilled loads to the supervisor immediately.
19. When traveling, elevate the load or forks only enough to clear the floor and inclines enroute.
20. Always get off the truck to open manually operated doors and gates.
21. Keep hands, shoes and trucks clean—free of oil and grease.
22. Confine all truck lubrication, battery charging and repair work to truck maintenance men.
23. Keep aisles to fire fighting equipment clear at all times.

Incidentally, in connection with mechanical handling equipment, the Handbook of Fire Protection, issued by the National Fire Protection Association, has this to say:

"All mechanical handling equipment, such as fork or lift trucks, piling and stacking machines, should be of approved type operated by trained personnel and maintained in a safe manner. Gasoline-powered equipment should be refueled outside of storage buildings and should be stored and serviced in separate fire areas. Electric-powered equipment should be disconnected when not in use. No mechanical handling equipment of a type which may produce flame or sparks should be used in any location where extra-hazardous materials are stored. Where mechanical handling equipment is used, necessary guards should be provided to prevent accidental damage to fire doors, sprinkler piping, or other fire protection equipment."

Charging batteries is another subject that enters into safe truck operation and maintenance. It's just common sense to wear rubber gloves and goggles when handling electrolyte solutions. A rubber apron isn't a bad idea, either. And if solution is spilled or splashed on the skin or clothing, have plenty of water to wash it off thoroughly.

It's never good practice to lay a tool or a piece of metal on a battery. Keep over-



head chains, cables and rods away from it, too. And use brushes with wood or other insulated handles. Sparks and shocks can be dangerous.

Don't allow foreign substances to fall into filler openings and keep lights, fires and cigarettes away from them.

Sulfuric acid is powerful stuff, so don't let it run onto ordinary cast iron, lead, steel or brass drainage.

It's always safest to keep the cell temperature below 110 degrees Fahrenheit when charging. And all authorities assume that electric truck users know the importance of having the battery maintenance location in a clean, cool, well ventilated spot with plenty of working space.

When it comes to gasoline powered trucks, the usual precautions followed with motor vehicles apply. Because of the fire and carbon monoxide hazard, special attention should be paid to ventilation when such trucks are used indoors. Manufacturers of such trucks keep the low-type exhaust pipes at least 20 inches above the floor and the vertical-type at least 72 inches above the floor to give maximum practical protection against the spark and fume hazard.

You now have some idea of the safety factors we build into our electric trucks and what we think is a fairly good list of safe rules. By having a good system of plant lighting, warning signs, route marking, traffic regulations, good housekeeping and carrying on safe loading, unloading and stacking practices, you will have gone a long way in cutting down accidents and the costs that go along with them.

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# Safe Practices in Handling Materials in a Steel Fabricating Plant

By A. T. METCALF
Supervisor of Safety, Bethlehem Steel Co., Pottstown, Pa.

One definition of the word "fabricate" is to put certain pieces together for the completion of a required object or unit. When we were children we would "fabricate" many things with building blocks, etc. Now as adults those of us in the steel fabricating industry have laid aside our blocks and are now putting certain pieces of steel together toward the completion of units which go to make up the giant structures of the world.

Whether it be toy blocks or steel, in putting pieces together they must be handled either manually or by use of mechanical equipment. Therefore in our industry the handling of materials is a continuous process, beginning with the receipt of the materials from the mills and continuing until the finished product is loaded for shipment. This constant handling constitutes a hazard which will stand high on the list of causes of accidental injury if we are not alert and have a definite program for the control of this type of injury.

*Equipment*—Cranes and hoists are usually installed when the shop buildings are built and should be of proper design and size for the work for which the plant is built. However, we must have slings, hooks, dogs, clamps, etc.

If we are considering a small shop where it is not practical to manufacture the equipment needed, it is very important that the person who does the buying deals with a supplier who has full knowledge of the requirements and will do an honest job by furnishing adequate and safe equipment.

On the other hand, if the plant is a large one with proper facilities and personnel to manufacture its own handling equipment, we must be careful and see that the job is kept under control. We dare not permit every Tom, Dick or Harry to make any piece of equipment he may take a notion to turn out. Proper knowledge of strength of materials is necessary; therefore, the control should be placed in one of the engineering departments of the works, preferably the master mechanic's office, in conjunction with the safety department.



Adequate records should be kept of all such equipment. Every chain, hook, dog, etc., in use should be catalogued and a card record kept on each item. This record should indicate when the item was placed in service and to which department it was assigned. If repairs are made, it must be noted on the card, with date and nature of repair. The date of periodic inspections must be noted, also condition at the time of inspection.

The department responsible for manufacture should keep on file a sketch of each item so that replacements and duplicates will be of the same size and quality of material.

In case of repairs, no piece of lifting equipment should be returned to service until it has been inspected by a properly authorized person. It is of utmost importance that repairs are not made in the shops by workmen who use the equipment. Supervision must see that repair orders are made out and the repair made only by the proper person.

Requests from operating supervision for new pieces of lifting equipment should be discussed by the mechanical and safety department and not be granted if in their judgment the item requested will create a hazard.

We feel without a doubt that all the above mentioned regulations regarding the manufacture of lifting equipment should be adhered to and that any unauthorized parts such as "S" hooks made of wire, rods, etc., that may creep into an operation, should be destroyed as soon as noticed.

The maintenance of the equipment is as important as its manufacture. Cranes and hoists should be inspected at least twice a year and more often if an unusually large amount of heavy work is to be done. Card records of these inspections indicate conditions as found, also any repairs suggested by the inspector.

Iron sling chains should be annealed and inspected once a year if used inside the shop, and those that are used outside should be inspected twice a year. Of course, all equipment should be checked by the gang leaders at the beginning of each shift.

Each chain, hook, dog, etc., should be marked by an identifying number or code signifying to which department it has been assigned and should not be removed from that department.

*Safe Practices*—The first rule for safe practice in the plant rests with management in planning the work properly. If supervision schedules the fabricating of a ten ton piece in an area where there is only five ton lifting capacity, we know what the results will be. Another portion of management's responsibility is the proper training of new employees and a continuous check on the habits of the old ones.

Material coming into the shop from the receiving yards must be loaded so the lifting equipment at the point where it is to be unloaded will not be overtaxed.

Material must always be piled in a secure manner and in a way which will permit safe handling when it is to be moved again. The tiers of piles should be separated by wooden blocking. This blocking must be of sufficient size to support the weight and be long enough to run through the pile and not be made up of a series of shorter blocks placed end to end. We have never considered it good practice to pile steel against steel, especially in winter when frost might collect on the surface and cause slipping.

If narrow gauge trucks loaded with material are to be pushed through the shop by a tractor, a man must walk ahead of the load to warn workmen of the approaching hazard.

Over-loading can be the cause of many accidents and must be guarded against religiously. Cranes and hoists should have their capacity marked distinctly on them. Hooks and dogs should also have their capacity stamped on them. At the Pottstown Works we have copies of a chain chart, framed and under glass, placed at many conspicuous places where workmen may consult them to determine the proper size of chain for the lift to be made.

The bills of finished parts indicate the weight of a unit. Gang leaders and foremen are familiar with methods for figuring weights of separate pieces. There should be a minimum set as to the size of chain permitted in each department. A chain lighter than this minimum must never be permitted in that department.

Manual handling of materials should be held to a minimum. Hernias are painful and cause the loss of considerable time.

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Crane operators should be given a physical examination twice a year. If the examination discloses any degree of a heart condition, high blood pressure, etc., the man should be removed from the crane at once.

It is very necessary that crane operation signals from floor or ground to the operator in the crane cab be given correctly. A standard set of signals should be adopted and used throughout the plant. Who is going to give the signals is also very important. It is well to make the gang leader responsible for the giving of signals and instruct the other members of the gang to get into the clear and refrain from taking any part in the signals. Two or more people giving signals will confuse the operator and anything can happen. Crane operations ordered by a jerk of the head or by word of mouth are very unsatisfactory and should not be tolerated. At Pottstown proper crane signals are published in a general Safety Code Book, a copy of which is furnished every employee.

The carrying of loads over workmen is a very unsafe practice. Crane operators must give ample warning when approaching workmen on the floor. If the man on the floor or ground does not heed the warning the craneman is justified in stopping his crane and waiting.

In a fabricating shop there is one commodity other than steel which must be handled. We are referring to paint. Great quantities of paint must be mixed and the handling of the various ingredients present a hazard not only from the standpoint of accidents but also fires. Paint houses should be equipped with lifting equipment to enable the attendant to do his work without the physical effort attached to dipping. This not only reduces the possibility of injury but helps toward better housekeeping, thereby minimizing the fire hazard.

Another safe practice in the handling of materials as well as in all other operations in a fabricating shop, is the wearing of proper protective equipment, particularly safety shoes and goggles. At Pottstown, we now have better than 80 per cent of our workmen wearing safety shoes. This was accomplished by education and salesmanship. We *do not* have a compulsory ruling on the wearing of such shoes. We feel we have been rewarded for our efforts on the wearing of safety shoes in the fact that we have experienced only three lost-time toe injuries in the past ten years.

On the matter of eye protection, we are happy to report we have operated 11 years and 7 months which is more than 33,000,000 man hours without a single major eye injury. By major eye injury we do not mean loss of vision; we mean an injury that would require the loss of a shift. We do not make this statement boastfully, only in the hope that it might be an inspiration for some one else to make the effort to attain a similar or better record.

## Handling Material with Wire Rope

By B. N. CARLSON

Chief Wire Rope Engineer, American Steel and Wire Co., Hamden, Conn.

For many years wire rope has been an essential part of the large variety of machines which are used to handle raw, processed, or finished material. To be more specific, wire rope is the all important link by means of which the energy of a rotating drum is converted into the desired movement of a particular package. The ever increasing use of this product as a hoisting medium is conclusive evidence that it has proven an efficient member of the hoists, cranes, excavators, conveyors, loaders, unloaders, etc., which are so essential to modern industry.

Coincident with this increased usage there has been an awakened realization of the dangers of misapplication, and accordingly rules and advisory procedures have been drawn up by government bureaus, industrial organizations and wire rope manufacturers covering the judicious selection, proper installation, effective maintenance, and adequate inspection of wire rope. Pamphlets, handbooks and catalogues on these subjects are constantly available and therefore no recapitulation of their contents is necessary. However, in order to understand these rules and procedures and to apply them intelligently, it is necessary to comprehend the fundamental facts on which they are based. It is the objective of this paper to deal with these fundamentals.



In the first place, what is wire rope? Webster's dictionary says, "Wire rope is a rope formed wholly, or in great part, of wires." The chances are that everyone in this room has seen a rope, and, therefore, no amplification of this definition is necessary. However, to better understand some of the terms which will be used, it may be advisable to add that a plurality of wires are helically laid together to form a strand and that several strands, most commonly six or eight, are then helically laid together around a core of wires or fibrous material to form the rope.

Wire rope is used as a tensile device. It is not designed to be used in compression or torsion.

Wire rope differs from other tensile devices in that it has the ability to sustain loads under conditions of occasional or repeated bending.

Having established what wire rope is, and how it is used, let us consider the properties it must possess to satisfy the described application requirements.

1. Being a tensile mechanism wire rope must possess strength.
2. Because it is subjected to bending, wire rope must possess fatigue resistance.
3. Because it is a moving part of some industrial unit, it is subjected to wear and accordingly must possess abrasion resistance.

Depending upon service conditions these properties are required in varying degrees, and, therefore, it is of interest to investigate how these results are achieved.

The strength of a wire rope is determined by its size, grade and construction. The size, designated by inches of diameter, is a function of the metallic area, and accordingly it is obvious that the larger the diameter, the stronger the rope. The grade denotes the tensile strength of the wires from which the rope is fabricated and may range from iron grade with a unit strength averaging 100,000 lbs. per square inch to improved plow steel grade with a unit strength averaging 250,000 lbs. per square inch. Between these two extremes are mild plow steel grade with an average unit strength of 190,000 lbs. per square inch, and plow steel grade with an average unit strength of 220,000 lbs. per square inch.

Fatigue resistance, that is, the ability to withstand flexure over sheaves and drums without fracture, is obtained from the use of tough ductile wires especially fabricated for wire rope. Varying degrees of fatigue resistance result when these wires are manufactured into rope constructions with greater or less flexibility. For example, ropes composed of a few wires of large size will be relatively stiff and low in fatigue resistance when compared with ropes composed of many wires of small size. Between these two extremes lie the regular run of rope constructions such as 6x7, 6x19, 6x37, 8x19, etc. In each of these symbols the first numeral indicates the number of strands in the rope and the second numeral the number of wires in each strand.

The ability of a wire rope to withstand abrasion is determined by the size and the chemistry of the wires; especially the outer wires since they are exposed to maximum wear. Obviously, the larger the wire size, the greater is its resistance to abrasion. Furthermore, the higher strength ropes are better able to withstand wear than the lower strength ropes because of a greater carbon and manganese content. In terms of wire rope grades this means that improved plow steel ropes have more abrasion resistance than plow steel ropes, plow steel ropes have more abrasion resistance than mild plow steel ropes, and mild plow steel ropes have more abrasion resistance than iron ropes.

Individually these properties of strength, fatigue resistance, and abrasion resistance are not difficult to obtain, but collectively they represent a complex assignment because they are so related to each other that it is impossible to accent one of the three without detriment to the other two.

Satisfactory performance demands that running ropes possess all three properties, and, therefore, it is necessary to establish an effective balance which meets the requirements of the specific installation under consideration. This is a problem for the wire rope engineer, and wire rope manufacturers are at all times ready to cooperate with their customers in studies which will result in the most advantageous solution.

It has been established that wire rope must possess certain properties which are dictated by service requirements. By due



consideration of the same fundamental properties during service, safe wire rope operations will be obtained.

The initial requirement for safe operation is a rope of adequate strength at all times. This not only means a strong enough rope to begin with, but also means avoiding overloading during service. It is rare that an installation is encountered which was not initially designed to operate at a proper factor of safety. However, it is not at all rare to find wire rope installations that are being operated in excess of their rated capacity with consequent danger of overloading the rope.

There is an apparent tendency to consider wire rope as not overloaded so long as it supports the load without rupture. Actually a rope is overloaded when it is stressed beyond its safe working load because the establishment of this figure is based not only on the loads applied but also on factors such as the speed of operation, the acceleration and deceleration, a normal amount of wear, the facilities for inspection, and the danger to life and property in case of failure.

Overloading can in general be avoided by not exceeding the rated capacity and designated hoisting speed and acceleration. However, sometimes because of circumstances beyond an operators control, a shock load is imposed the magnitude of which is indeterminate. High instantaneous stresses are very apt to result from these impacts and as a result even if rupture does not take place the elastic limit of the rope has been exceeded with consequent permanent distortion of the component wires. Therefore, it is advisable to replace any rope which has been subjected to an impact load.

In addition to strength it has been concluded that a wire rope must possess fatigue resistance. Fatigue manifests itself through "square off" wire breaks which occur as a result of excessive bending stresses. Although as it has been pointed out, improved fatigue resistance can be obtained through the use of a more flexible rope, it is, nevertheless, desirable to also consider possible equipment changes which will retard or eliminate fatigue failures. The most common cause of excessive bending stresses is undersize sheaves and drums. Suitable replacements for such parts should be made wherever possible. If changes of this nature cannot be introduced then it is vitally important that the worst conditions be recognized and a suitable inspection frequency be maintained so that the development and progression of wire breaks can be promptly tabulated.

Fatigue failures are also quite apt to result from vibratory stresses, especially at spots where dampening consistently takes place, such as end fastening. In such instances it is advisable to make regular cuts from the end of the rope so as to change the dampened section.

Rope vibration is unavoidable on installations that operate at high speeds accelerations and decelerations. However, lax maintenance such as failure to replace sheaves which have worn out of round can aggravate the problem unnecessarily, and furthermore, cause an unstable and consequently dangerous operating condition.

Normal rope wear as a result of operating over sheaves and drums is a natural phenomenon and accordingly is to be expected. However, any operating conditions which cause abnormal wear should be corrected not only so as to obtain improved rope life but also on the basis that abnormal operations are unsafe operations. The following are typical causes of unnecessary abrasion which can and should be eliminated.

Proper design requires that groove diameters in sheaves and drums shall be machined with a tolerance varying from 1/32" to 3/16" over the nominal rope diameter. Unfortunately this is not universally recognized and as a result it is not uncommon to find re-machined grooves which measure exact size, that is, with no oversize tolerance, which means that the groove is actually undersize. In other cases it is not even recognized that as the sheave groove wears and deepens, it also reduces in diameter.

An undersize groove because it does not provide proper working clearances imposes a wedging action on the rope which results in heavy, uneven wear. As the rope is bent around a sheave, the strands and wires if unrestricted slide upon each other and thereby adjust themselves to this curvature. However, when the rope is pinched in an undersize groove the strands and wires bind against each other, which not only causes internal and external a' ision, but also hinders movement, thereby forcing the top



strands to carry more than their share of the load, a decidedly unsafe practice.

Another unnecessary condition is flange wear as a result of bad sheave alignment. Flange wear is the chafing which takes place when a rope rubs against the flange of the sheave upon entering and leaving the groove. Obviously when sheaves are properly aligned the rope enters and leaves the sheave grooves without any interference. The danger of misalignment lies in the fact that the flange wear which it imposes is unsymmetrical, that is, it is not continuous but occurs in spots on the rope. Therefore, it is quite apt to pass unnoticed, but the weakened section is a definite hazard.

Flange wear can also result from an excessive fleet angle, that is, the side angle at which the rope aproaches the lead sheave from the drum. Corrective measures which should be followed are investigation to determine if the right and left fleet angle are equal as they should be, and increasing the distance between the lead sheave and the drum so as to reduce the fleet angle. If space limitations prevent movement of the lead sheave or drum, it is advisable to resort to a lead sheave with a more widely flared groove.

Fluted grooves, that is, grooves where the strands of the rope have worn an imprint, result from excessively high radial pressures for the sheave material used. The effect of these corrugated grooves is particularly bad on replacement ropes because the imprints may not match the length of lay of the new rope and as a result it rides the high spots. In addition to causing a scabby, uneven wear the rough spots are apt to cause nicking and peening of the wires, which can serve as focal points for the propogation of fatigue cracks. The remedy is a harder sheave material which can resist the existing pressures without deformation, or a reduction of the unit pressure by increasing the sheave size, or reducing the load.

Unnecessary rubbing of a rope against or across a hard object causes abnormal wear and accordingly should be corrected. If the obstacle cannot be removed or altered so that the rope does not contact it, then the need for protection through the installation of sheaves, rollers, or scrubbing boards is indicated. However, the insertion of deflectors in the form of sheaves or rollers must be done judiciously or the remedy may be as bad as the disease. In other words, the deflectors must be of proper size and design.

Wire rope may be classed as a machine because it is composed of many interrelated working parts. Efficient operation of any machine requires adequate lubrication and wire rope is no exception to this rule. The average user does not fully apreciate that the wires in a rope are made to tolerances which range from plus or minus .0003" in the smaller sizes to plus or minus .002" in the larger sizes; and that these wires must slide with respect to each other within the rope structure as the rope bends over sheaves and drums. If a film of lubricant is not present the wires bind causing greatly increased friction and the result is similar to running any machine without oil and grease, that is, at the best, early failure, and at the worst, a sudden, unexpected breakdown.

A second important reason for lubricating ropes is to prevent corrosion of the wires. Corrosion very markedly reduces fatigue resistance but worse than that, the strength of a corroded rope is absolutely indeterminate. This means that a rusty rope is an extremely dangerous rope because its strength cannot be evaluated. Furthermore, any shock load will almost certainly cause rupture because being rust-bound there is no possibility of proper load distribution.

Wire ropes are lubricated during fabrication and if properly done each wire is encased in lubricant. However, this initial lubrication is generally not sufficient to last for the entire rope life and therefore it is necessary to supplement the factory lubrication with field lubrication.

The frequency of application and the type of lubricant is dependent on the character of the service to which the rope is subjected. In some cases a light lubricant is necessary, in other cases a heavy material. However, regardless of whether an oil or grease is used the lubricant should be free from acids and alkalies. Field lubrication should be started before the original coating of lubricant shows signs of disappearing to prevent the possibility of operating with a dry rope.

In order to realize efficient and safe wire rope performance it is necessary that each component part do its share of the work.



Suitable materials, accuracy of design, and careful fabrication are recognized by the manufacturers as the requisites for meeting this objective. However, any operating condition which causes distortion of the rope structure upsets the built in balance and thereby reduces the efficiency and safety. Common causes of distortion are:

1. Kinking as a result of slack being allowed to accumulate and not using proper precaution when the rope is pulled taut.
2. Improperly attached fittings.
3. Carelessness during installation.
4. Uneven drum winding especially where there are several layers of rope on the drum.

Some wire rope constructions can withstand deformation better than others, but in spite of this fact proper precautions to prevent abuse are the only solution to getting the most effective rope performance.

One of the outstanding safety features of wire rope is derived from the fact that it consists of multiple members. If a rope has not been abused, it gives warning of the approach of eventual failure by the progressive development of broken wires, which can be easily detected a considerable length of time before an unsafe condition is reached. By comparison, strength members such as single rods or bars, or linkages of such solid units usually fail completely and without warning. Failure of all wires in a rope will not occur simultaneously even in a rope section which has been subjected to identical service condition.

Small variations in physical properties within commercially recognized limits plus the fact that progression of fatigue and wear develops gradually, are the reasons breaks occur successively and not simultaneously. This characteristic makes wire rope the safest and most dependable tensile mechanism that is available for the raising, transporting and lowering of material.

The features which make wire rope such a safe and efficient tensile device apply equally well whether it is used as a running rope or a sling. Wire rope slings have greater abrasion resistance than slings made from hemp rope, are not susceptible to the weakest link ailment of chain, and size for size are stronger than either hemp or chain slings. As in the case of running ropes, wire rope slings show by inspection their true condition. The appearance of broken wires clearly indicates the fatigue of the metal, and the termination of the useful life of the sling.

The main objection that has been raised to the use of wire rope slings, namely that they were cranky and hard to handle as a result of their tendency to kink and take a permanent set when bent around a small radius of curvature, was eliminated by the introduction of braided wire rope slings a few years ago. Braided slings are made by interweaving several regular laid ropes, the most common being 6 part and 8 part braids. The resultant structure is extraordinarily flexible and consequently practically kink proof.

Safe wire rope operation is also efficient wire rope operation because the same abuses which impair strength, fatigue resistance, and abrasion resistance also reduce rope life. The inherent safety of rope can be neutralized by failing to rectify the violations which have been described. However, by recognizing the probable causes of failure and acting promptly, accidents will be avoided, wire rope costs will be decreased and safe handling of material accomplished.

# Manual Handling of Material in a Foundry from a Safety Standpoint

By T. W. SHIPLEY
Foundry Manager, Caterpillar Tractor Co., Peoria, Ill.

Foundries of today have progressed far in the direction of cleanliness and mechanized material handling from those of ten and twenty years ago. In most production foundries a great percentage of the operations are mechanized by means of conveyors, hoists and automatic equipment to such an extent that operations in a foundry



very much resemble any other manufacturing operations except for the fact that metal is being melted and poured. Therefore when we consider the manual handling operations that are performed in a foundry we find a striking resemblance to those that are performed in a machine shop. After all, what difference is there between handling nuts, bolts and gears, etc. in a machine shop or handling cores, flasks, bottom boards and castings in a foundry.

Whatever operations we perform, even those done mechanically require some manual operations and manual handling of material. It has been our experience that operations that are basically manual produce fewer accidents than those in which the manual operation is only a part of or incidental to the basic mechanical operation. This apparently results from the fact that where we have a single operation we are more prone to analyze it thoroughly and correct the unsafe practice, whereas in the mechanical operation where the material handling by hand is only incidental we forget that particular part in our desire to have safe practices in the mechanized operation.

I can think of past experiences for instance at the core blowers. Here we have a machine which blows sand under 100 lb. air pressure into a core box. We have spent considerable time and effort in providing safety devices to prevent the man from exching his hands in the machine while it is operating. Interlocking air valves which require the use of both hands at the same time insure the proper sequence of operations, which in turn prevents sand at high pressures from being blown against him or other people in the same area.

Nevertheless, the man manually puts the empty core box under the sand magazine and removes it after it is filled. This part of the operation affords an excellent opportunity for pinched fingers and broken feet if the man is not careful and wide awake, and we have had accidents from this source.

The key to this problem lies first in the correct analysis of the operation, taking into account both the mechanical and manual details and in the proper instruction and emphasis of the instruction regarding the correct methods of handling. For this reason supervision must be ever alert to secure better and safer methods; must never assume that a new employee should know how to do the job safely or that an old employee ought to know because he has had previous experience.

In my opinion most of us are familiar with the proper method of working safely and how we should perform a certain task, but at the same time we are all inclined to be lazy and want to do things the easiest way without thinking. In making this statement my hope is to bring this to your attention and make you realize that some of the things we do wrong every day come only from a lack of thinking and not from a lack of knowledge.

The following basic principles cover most any application of manual handling of material and certainly are worthy of consideration by every supervisor when giving instructions to his men.

*Size of the Load*—How many of you ever tried to pick up a mattress. Here is a load not so heavy but at the same time very unwieldy and difficult to handle by one person; still it can be easily handled by two people.

In this connection how many of you have had people under your supervision who were the type who wanted to show off, wanting to show everyone else how big and strong they were and how much they could lift and instead of being reasonable would try to pick up loads which could not be comfortably handled by one man.

*Make Sure That the Footing Is Secure*—We do not build houses on poor footing but how many times have you seen people pick up a load while standing on a loose brick, a piece of a core or an object which places one foot at a higher level than the other? When this occurs you do not have the same strength that you do on a solid footing because all the weight is placed on one leg.

*Keep Feet Together and as Close as Possible to Object*—This is only an example of simple mechanics because the closer the two legs are together when one is lifting, the stronger the lifting member becomes, because it more nearly becomes one solid member.

*Bend Knees and Keep Back as Straight as Possible and Lift with Leg and Arm Muscles, Keeping Object Close to the Body*

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—These are the most important items to be considered when *lifting* any material. Many lost time cases are the result of injured backs. In addition to being lost time cases they are also controversial, because we are never able to find out exactly how a back was injured. Usually the report simply states that the man leaned over to pick up something off of a table or conveyor when he noticed a pain in his back. An engineer will tell you that the farther away from a column your load is supported the greater the stress becomes on the supporting member. It only stands to reason then that using a hinged member such as the knees to raise and lower an object does not place the strain on the back if the object is kept as close as possible to that supporting member.

You are all familiar with a jib crane which is supported from a column and is commonly known as a cantilever arm. An engineer knows that the farther away from the post that the load is supported the greater the stress on the cantilever arm. This is the same thing that happens when we try to lift an object with the back bent and the load away from the body. In the case of a jib crane the cantilever arm will support a given load to a certain length but must be increased in size to support a load farther away from the center post. In the case of a human being this cannot be done because the back is already fixed at its capacity and for that reason if the load is picked up nearer the column the column carries the load and not the cantilever arm.

When necessary to change directions, do not twist the body. Lift the object to the carrying position and turn the whole body including the feet. When a member is twisted it becomes weakened so that maximum strength is not available to do the work. For example if a man is placing molds on a conveyor and does it in a twisted position for any length of time his back becomes weakened to the point where he can no longer do this work. If he were to pick up the mold in a straightened position and then turn his whole body he would have no difficulty with his back.

When placing an object on a bench or table, place it on the edge and move it forward with the arm, assisting if necessary by pushing against the object with the body. This is just a matter of the simpliest and easiest way to do it as well as the safest, but still we find people inclined to pick up an object, place it on a bench and stand as far away as possible from it while trying to push it farther onto the bench with their back in a strained position.

When raising objects to the top of a pile, especially if over shoulder height, lift until the object is at or above waist height. Here again we emphasize the necessity of doing the lifting with the arms and knees and keeping the back as straight as possible at all times.

To put a load down bend the knees and lower the load with the leg and arm muscles, keeping the back as straight as possible.

The following principles of lifting and handling should also be a part of the employees' training.

1. If it is a heavy job, get help. When two or more men are handling the same object, pre-determined signals should be used and warning given when one worker is about to relax his grip.

We have a number of instances in the foundry where two men are used to take empty flasks off of a conveyor and place them over a pattern on a molding machine. This operation can be the source of serious accidents if the two men do not react alike. They must both move together and let loose at the same time or one of them is very likely to get a broken finger or a smashed foot.

2. Throwing is hazardous. If materials must be thrown, keep feet as much out of range as possible and see to it that other workers are not in danger of being struck.

There are many times where it is advantageous to throw material into a tote-box. A good example might be grinding operations on small parts. In this case the operator takes the part from a chute in front of him, grinds off the gates and risers and throws it into a tote box placed either at one side or behind him. A good precaution in this case is to place a shield at the back of the box several feet higher than the top of the box to insure against the possibility of the piece part missing the container and landing on someone's foot.

3. Guard against injury from ends of wire and strapping, particularly when tension is released on stretched or tightly coiled wire. Also watch for broken strands in wire cable.

4. Inspect material for slivers, jaggers or burrs, rough or slippery condition. Use good hand leathers or gloves that afford good gripping power and protection.

5. Wet objects, or those coated with dirt or grease, make handling especially hazardous. They should be wiped dry or clean before handling.

6. Determine weight of load, use proper handling tools (bars, tongs, etc.) and mechanical handling equipment if available.

7. Before lifting and carrying material, check the route to be travelled for tripping hazards and under-foot conditions.

8. Get a firm grip, one that can be held for the full distance to be travelled, and for necessary shifting of the load.

9. When placing the material on supports make sure the supports are properly placed and strong enough to carry the load.

10. When using blocks, place the object on a flat side, so that it will not tip. Where the object is to be placed on the floor, set one corner down first to avoid pinching the fingers. If the object is round, block it to prevent rolling.

11. Keep hands, feet, and the body in the clear. Blocks help to reduce up and lowering heavy objects.

12. Wear foot guards or safety shoes and eye protective equipment as the job may require.

Every person in our foundry is required to wear eye protection which is furnished by the company. All iron pourers, cupola operators, shakeout men, and slinger operators, pneumatic chippers, grinders and shot blast operators are required to wear tight goggles and all others are required to wear glasses with safety lenses. Everyone is encouraged to wear safety shoes while iron pourers must wear shoes without laces. They are also required to wear wool trousers faced with chrome leather and protective leggings, which we furnish. Cupola repairmen must wear protective safety hats while relining inside the cupola and all people working in areas which are hazardous with respect to falling objects wear foot guards.

13. Watch piled material, see that it is solid and keep it properly trimmed. Block or chock material to prevent rolling or sliding.

The work place area should be properly illuminated, the workway surface should be adequate, strong enough and safe enough. Consideration should also be given to conflicting traffic from other operations.

The utmost care must be exercised in the handling of objects which present special hazards, such as corrosive chemicals, hot materials, cold materials, electrically charged apparatus, toxic compounds, etc. All of these require special consideration, such as protective safety clothing, mechanical safety devices and special instructions regarding personal hygiene to be employed after handling exposure. After all the above factors have been considered, we then come down to the piece part itself. We should always consider its weight, bulk factor such as size and shape, the frequency of handling, how high or low it has to be lifted or stacked, the carrying distance between pick-up and delivery. Weigh all these factors against the qualifications of the man we are assigning to do that particular job.

Remember that some people cannot seem to coordinate the action of hands, feet, arms and mind at the same time, they have a slow reaction time while others are especially good on coordination and these people are especially adept at repetitive operations. Remember too, that many of us are victims of habit. I remember one humorous incident that will illustrate this. Recently we had a new employee who was unloading cores from a rack. He had previously been employed in a dairy washing bottles. One day one of the cores slipped from his hands and fell towards the floor striking this man on the arch of the foot causing a lost time accident. When questioned, this man admitted that he had been taught in the dairy when handling milk bottles to put out his foot to break the fall in case any fell from his hands to prevent breakage of bottles if possible, and so because of a habit which he had formed at his previous place of employment he had put out his foot when the core dropped, to break its fall and instead of saving the core he broke the arch of his foot.

I sometimes think that we consider many jobs so simple because there are no machines connected with the operations that

people do not worry about safety, yet I believe that statistics will show that more people are hurt at home than in industry and certainly in the home there are very few machines connected with any injuries.

We can invent, engineer and install the best safety devices to prevent people from being injured but I still believe the only real safety device is that one which we carry between our ears and remember always our need to think safety, talk safety, and set a safe example 24 hours a day. Remember also that making the job easier from a physical standpoint does not always make it easier from a safety standpoint.

We must assume and fulfill our responsibility as supervisors for accident prevention and a smart supervisor soon learns that the key to the situation is the man himself. He is an individual, no two of which are exactly alike, yet we go blindly ahead and expect people to react exactly alike in a given set of conditions.

We condemn people many times because they fail to think and see as we do. Make allowances for the fact that men you are supervising may not be as smart as you are or may not think or react as quickly as you do, yet he may be an ideal man for the job if properly handled.

A modern supervisor will study each of his men and find the key to each man on an individual basis. This can be done only by being close enough to his people to know them thoroughly, understand their habits personally and to enjoy their confidence to an extent they will share with you some of their personal problems.

Webster's definition of safety is freedom from injury while on the job. Let us assume our responsibility in making it a reality.

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# Overhead Crane Block Failures—Limit Switches and Hoist Cables

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The Association of Iron and Steel Engineers has sponsored standard specifications for heavy duty overhead traveling cranes since 1909, and at the present time another revision has been referred to the Board of Directors of the group for adoption.

The subject of this talk refers to three items in these revised specifications that received a thorough analysis before they were rewritten to comply with good practice on modern cranes. These three items are grouped because a limit switch failure usually results in the hook block being pulled up against the trolley frame, breaking the cable and dropping the block. To better understand this problem, a review of the workings of the hoisting mechanism of the crane should be of assistance.

*1. The Motor*—The great majority of steel mill cranes are powered with direct current motors. This type offers certain advantages in torque, ease of control, brakes and operating characteristics over the alternating current motor drives. Further, these motors as used on the hoist are series wound, which type gives the greatest starting torque and the most simple control since there is no shunt field to handle. Due to the absence of a shunt field, which would create a flux of some constant value and thereby have a fixed influence on the motor speed, the restraining force to limit the motor speed comes from the series field. This field, as the name implies, is in series with the armature, and when heavy loads are on the crane the heavy armature current flows through the series fields and the motor speed has a value of perhaps 500 RPM. But if the load is removed from the crane hook, the motor load, hence the current, is reduced and the speed may rise to 1200 RPM or greater. This characteristic is often overlooked in the application of limit switches.

Another characteristic of this type of motor that has an important bearing on limit switch operation is the maximum



torque. As an example, the No. 12 Frame A.I.S.E. Standard Motor has a crane rating of 65 HP and a torque at full load of 525 foot-pounds at a one foot radius. It has a maximum torque at the same radius of 2,625 foot-pounds.

If, for purpose of illustration, we consider this motor installed to drive the hoist motion on a 20-ton crane with a full load hoisting speed of 50 feet per minute, we would find the gear ratio from motor pinion to drum gear about 14.44 to 1, the block reeved with 4 parts of 6x37 strand improved plow steel cable ¾" diameter which has a breaking strength of 30.5 tons, and the factor of safety on the ropes, so far as the lifted load is concerned, of 6.1. By calculating the pull on the rope with a maximum torque of 2,625 foot-pounds, we find it to be about 70 tons; hence, if the hook block is pulled against the trolley frame, the cable will break. Note that this maximum torque is 5 times the normal torque required to lift the rate load of 20 tons, and that under this condition the pull is not divided among the parts of cable as the sheaves are not free to move.

Modern gears on cranes are determined by a series of formulae which take into consideration both strength and wear. The wear factor usually predominates and results in gearing such that, if tooth strength only is considered, the factor of safety with normal full load is about 10. Hence, the gears are stronger than the cable.

*2. Cables*—The standard diameters of hoisting cables used in cranes are ½", ⅝", ¾", ⅞", 1", 1⅛", and 1¼". The accepted construction of these cables is the 6x37, which means each strand consists of 37 wires and 6 strands are used to make up the cable. Other than for use on hot metal cranes they are constructed around a hemp center which helps retain the lubrication on the individual wires.

When in service, the cable undergoes a series of bending stresses that bear a relation to the diameter of the hoisting drum and to the sheaves over which the cable is run. It has been determined by experience that cable life is also dependent on the construction of the cable in relation to drum and sheave diameters. Experience, plus many laboratory tests, have set up minimum drum and sheave wheel diameters to use with types of cable, and for crane use a minimum diameter equal to 30 times the diameter of the rope has been set as the standard for the 6x37 construction. On the few cranes using the 6x19 construction, the minimum diameters have been set at 45 times that of the ropes.

In cooperation with the wire rope manufacturers the Association of Iron and Steel Engineers developed a standard grooving as well as diameters for different sizes of cables. This grooving takes into consideration the manufacturing tolerances used by the makers, also the slope of the sides and depths so as to reduce cable wear to a minimum and have enough radius in the groove to prevent pinching.

The design of the hook block itself has also received a thorough study, and, in addition to the standard sheave wheels, they are so designed as to prevent the ropes from coming out of the grooves.

The above items are mentioned due to their effect on cable life. The new cable has a known breaking strength the worn cable has not. Plant maintenance men have their own methods of cable inspection and rules as to when cables should be replaced. Some count the broken wires in a lay, some use their judgment on the degree of wear, but none can determine how far fatigue has progressed.

Good design has the greatest influence on cable life, and the judgment of the maintenance man has to be taken for the date of cable replacement.

*3. Brakes*—Before discussing the operation of the limit switches, the hoist brake should be discussed. These magnetic brakes are usually of the shoe type and designed with a torque rating such that the brake will hold any load the motor will lift. Modern brakes have a self-aligning feature which distributes the pressure evenly over the entire surface of the lining. These brakes are set by positive spring pressure and the retracting torque developed is directly proportional to the spring pressure and constant at all speeds of the wheel.

If the 65 HP motor is used as an example, it has a $WK^2$ or flywheel effect including a 21" brake wheel of 143.5 pounds ft. Now, if the armature of this motor plus brake wheel is running full load speed of 440 RPM, it has a stored energy equal to

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4870 foot-pounds, and at the runway light load speed of 1500 RPM it has a stored energy equal to 55,000 foot-pounds. Obviously, the brake which is designed primarily for stopping and holding the load at normal speed will require more time and greater effort to stop the high speed light hook because of the greatly increased stored energy in the motor plus brake wheel at the high speed.

Brake linings wear, so does the wheel. *In addition, the lining must absorb the heat* caused by the friction between lining and wheel that produces the braking effect. This means that the torque exerted by the brake *is not constant over a period of time* and maintenance is required to keep its value at its original figure.

In addition, the fact that the hardest duty of the brake may be in stopping the light hook at high speed may be the answer to *the short brake lining life in* many operations.

The cables, the sheaves, the drum and the brake are all maintenance items that concern hoisting operations. They are related to cable life and limit switch operation and directly bear on chances for a broken cable and failure to hold the load.

*4. Hoist Limit Switches*—Hoist limit switches are installed on cranes to prevent over-hoisting. Should the hook block continue to raise, it will reach a point where the top of the block will come in contact with the bottom of the trolley frame, the drum or the upper sheave wheels, depending on the design. When this happens, if the travel has not been stopped the cable is broken and the hook block drops. On a 20-ton crane of mill design, this block may weigh 1200 pounds and, falling from a height of perhaps 30' results in damage to block, to anything it hits and, the most serious of all, fatal injuries. Despite all the precautions we are able to take, this type of accident *still happens* and we have both the human and the mechanical elements to deal with. Experience indicates there is no cure-all that can be applied to keep crane *limit switch* functioning 100 per cent, but we do know that good design, as pointed *out previously, plus* a knowledge of the operation and functions of the equipment, *are helps to decrease the number of failures.*

The following discussion attempts to point out some of the details on limit switch installations and how they operate. *Many* factors affecting operation are direct results of design and a well-designed installation does a lot toward successful operations.

*5. Installation of the Limit Switch*—In order to have the limit switch function properly, it is necessary to consider the mechanical details in the mounting design, which is a function of both the specifications for purchase and the layout by the crane builder.

During the past years, many crane trolleys were designed so that the limit switch operation was dependent on a cable running over two or more sheave wheels. These wheels, usually of small diameter, each had to be supported on two bearings which were difficult to lubricate due to the fact that the shaft only rotated when there was an operation of the switch. In addition, the impact of the block on the weight at high speed operations often threw the cable out of the groove in the wheel and prevented operation. There are many cases on record where the cable was thrown out of the groove and became jammed between the wheel and the bearing support. In addition, the shaft may be bound to the bearings due to lack of lubrication so that it will not turn. This type of design is not recommended due to its unreliable operation.

A variation of this design uses rods and bell cranks to replace the cable and sheave wheels. The several parts must be kept lubricated and the chances for lost motion and fouling of the parts may affect the operation.

There have been improvements in the layout and one of the designs recommended in the standard crane *specifications. In this*, the operating weight is kept in position by guides on the idler cables and the control cable from the weight to the limit switch extends directly to the operating arm. This is a preferred arrangement. Some operators object to the guided weight, claiming that a swinging block may hit the weight a glancing blow and tilt it before raising it, thereby delaying the action of the switch. Another objection is that many cranes do not have idler cables and the guide must be placed around a moving cable and it may catch on the strands and prevent limit switch operation.



To overcome this, the design, using a free swinging hinged steel bar that extends through the hoisting cables directly above the blocks, has been developed. With this design the bar is raised regardless of the position of the block and no guide contacts with the hoisting cables are required.

*6. Requirements for Hoist Limit Switches*—The recent revision of the Standard Specifications for Steel Mill Overhead Traveling Cranes contains the following requirements for limit switches:

A. "Each hoist motor shall be equipped with a standard dynamic braking limit stop connected directly in the motor circuit, to prevent overtravel in hoisting. The limit stop shall have a back-out circuit for lowering hook block from hoist master controller. Resistor shall be of the unit type with nonbreakable corrosion resisting elements mounted in standard mill type box. The limit stop shall be located so as to be accessible for inspection and, if possible, so that it will be operated by the hook block, or load beam, in such manner that no sheave wheels are necessary. Limit switches must reset properly and must be so designed to prevent grounds as far as possible.

B. "An arrangement using a free swinging weighted beam, hinged at one end and having the other end attached to the limit switch operating cable. The trip bar shall be so designed that the cables cannot jump out around the end of the bar which would permit the hook to rise outside the trip bar. The trip bar shall be so designed that no movement of the hoist and trolley can enable the trip bar to be jammed against any part of the crane structure.

C. "A weight directly connected with the limit switch and guided by suitable guides so that twisting cannot occur on the idler cables shall be used if so specified. Cable guides should preferably have replaceable maple wood or bakelite guide blocks to prevent wear on the cable.

D. "The actuating mechanism of the limit switch must be so placed that it will trip the limit switch in sufficient time under all conditions of hoist load and hoist speed.

E. "If sheaves are used in connection with the hoist limit stop, the pitch diameter shall not be less than 18 times the rope diameter. Cables should be guided through a hole on both ends of the sheave."

*7. The Limit Switch*—The modern hoist limit switch is a double pole, double throw cam operated quick-make and quick-break device, held in the operating position by a weighted arm. At the other end of the weighted arm the cable is attached, with one end fastened to the bar or weight that is moved by the hook block. When the block raises this weight, it overbalances the weighted arm, which moves the mechanism over the cams, and the limit switch snaps over. All modern switches have the feature that they snap open or closed and have no midway position.

When the switch operates, it opens the motor circuit cutting off the power which causes the brake to set, and closes contacts that complete a dynamic braking circuit that assists in stopping the motor.

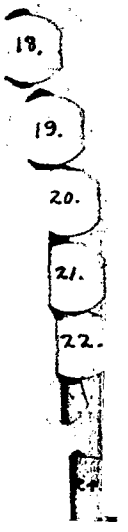
The electrical circuit setup for dynamic braking is that of a series generator into a resistor limiting the load. Under most operating conditions, the limit switch is tripped while power is on the motor in the hoisting direction. The field flux does not have time to decay and the build-up in voltage is immediate. However, if the power is removed from the motor circuit before the switch is tripped, the field flux may have time to decay and the voltage must be built up from the residual flux before dynamic braking is effective.

One of the characteristics of a series generator is that if a certain critical resistance is exceeded, the voltage will not build up from the residual flux. This critical resistance can be exceeded due to,

1. Loose lug or terminal connections,
2. Loose or broken resistor grids,
3. Poor condition electrically of brushes, brush shunts or commutator,
4. Poor condition electrically of limit switch contacts.

If any of the above conditions exist, the crane hoist must be stopped by the brake and if the brake torque is insufficient, the hook block may drop.

At this time, mention can be made of a condition that sometimes happens on over-hoisting. If, just as the block engages the



limit switch weight the operator plugs his hoist master controller, the hoist will be brought to a quick stop without the brake setting, due to the heavy dynamic braking effect. In one series of tests with light hook at 325 per cent motor speed, this distance varied between 11 and 13 inches plus the weight travel until the switch operated. The objection to this is the high currents set up to be broken by the limit switch contacts and a chance of flashing the armature.

There are some dynamic hoisting controls so designed that there is a shunted armature on the first point of hoisting. If the operator allows the hoist to operate the limit switch with his scheme of control, the brake will not set as it is energized through the shunted circuit. Most maintenance men are familiar with this type and either remove the slow speed hoisting feature or make the operator familiar with this condition.

All the foregoing has concerned the single motor hoists. On the hot metal ladle cranes two hoisting motors, operating in parallel, are used. On these cranes the load beam supporting the hooks has its hoisting cables between the main and the auxiliary girders, so if the hoist is raised too high, the load beam tries to lift the auxiliary girders or break the cables. For this type of crane there is a duplex limit stop which contains two switches, either in the same case or in two cases, with coupled shafts so that both motors are disconnected and the brakes set when the switch operates. On this type of crane, the control scheme is often used where the hoist control has the slow speed feature on the first point.

After the limit switch has been tripped and the hoist stopped, it is necessary for the crane operator to reverse his master controller to lower the hook block. This sets up a circuit through resistors which drives the hoist down. Should a heavy load be on the hook, there is danger of the overhauling action of the load plus the driving power of the motor to combine and cause a sudden drop of the block during the time of travel to the point where the limit switch resets. There are several control schemes to prevent this, and it should not be overlooked in the purchase of crane hoist control.

The foregoing paragraphs have pertained to the various parts of crane hoisting mechanism that concern the life of the cables and the emergency stopping of the hoist. The following paragraphs give further details on the actual operation.

Earlier in the paper, the characteristic speed load curve of a series wound mill type motor was shown whose full load speed was 450 RPM. Assume this 65 HP motor to be on a crane hoist with a rated full load hoisting speed of 50' per minute. With a light hook the motor load is under 10 HP and by reference to the curve the motor speed at this load may be 1500 RPM. At this motor speed the hoist will be raising at a speed of 167' per minute, or 2.78' per second.

On this particular crane the limit switch is so located that the weight can travel only 18" from the time the hook block first contacts it until it strikes the upper sheave wheels or the trolley frame. The distance the weight has to travel before the limit switch arm operates the cam, varies from 2" to 9" in the many designs now installed. If we assume this particular switch has a weight travel of 6" before the switch trips, then only 12" remain to complete the operation. At a speed of 2.78' per second, the block will travel 12 inches in .36 second. In this short time the switch must trip, the brake be set, and the motor be brought to rest. This time interval is too short and it is doubtful if the block will be stopped before the cables are broken.

This high speed light hook hoisting is the most difficult operation for the equipment, as with normal full load the time available for stopping is increased 300 per cent. These two conditions are similar to those in stopping an automobile. If the car is going at a rate of 10 miles per hour, it can be brought to an emergency stop in a few feet; but, if going 60 miles per hour, the stopping distance increases as the ratio of the square of the speeds. The same law of mechanics whereby the stored energy is equal to the mass or weight times the square of the speed applies in both cases.

Hence, limit switch weights or bars must be set so that sufficient time elapses after the weight is lifted to allow the motor to be stopped at 350 per cent normal full load speed.

High speed light hook hoisting has not been taken into consideration in many crane installations where the prime consideration was the maximum height loads can be lifted. It is seldom that the manufacturers of limit switches have been consulted to find out what distance the operating cable must travel before the switch operates. It is good practice to find out this distance and by test determine the maximum light hook hoisting speed. From this speed, calculate the distance the block will travel in .45 second. To this distance, the cable travel to operate the switch should be added and the result would be the minimum distance the limit switch weight or bar should be set below the trolley frame, upper sheaves or other part of the crane where the hoist block would strike.

On certain crane movements in the plants, there are occasions when loads have to be lifted to a point where the block must be raised into the zone where the limit switch functions. This requires a careful operator and should only be done with permission of a responsible party. There are other operations where the limit switch is used as the stopping control for many lifts. This practice is dangerous and should be controlled. Limit switches are placed on crane hoists to prevent over-hoisting and operators should insist that they be given a chance to function.

This discussion has been confined to modern limit switches and cranes. There are hundreds of old cranes in operation with obsolete limit switch design and manual controllers. One type of limit switch consists of hinged wooden blocks with carbon contacts. In this type there is always the danger of the hook hitting the blocks a glancing blow and swinging them, with the result that the contacts are not closed. This type of switch depends entirely on dynamic braking, the motor circuits not opening nor the hoist brake setting. The switch after an operation must be opened by means of an insulated stick which, in most cases, is the broom kept in the crane cab. This type and several other designs will stop the hoist under most conditions, but from the records of dropped blocks, it is a paying proposition to replace them.

In conclusion, we are all interested in preventing accidents resulting when the hook block falls from a crane. The following suggestions, if followed out, will help minimize these failures:

1. Pay careful attention to the design of the crane and the mechanical details of the limit switch installation. Be sure to have enough travel for the weight to allow the switch to operate.

2. There is no substitute for good maintenance to insure reliable operation. The frequency of inspection may be daily or weekly or even longer, depending on the crane service or its location. This inspection should include a tripping test consisting of two operations. The first, gradually inching the block so that it raises the weight and trips the switch. If this test is successful, lower the block near the ground and, with full speed light hook hoisting, permit the switch to stop the hoist.

3. Have close supervision over the crane operators. One of the practices that contributes to jeopardizing the condition of a limit switch installation is that of using it as a service stop, when it is intended as an emergency safety device. This type of stopping requires many more operations per turn than should be expected during the life of the switch under normal operating conditions. If current peaks of 250 per cent or greater are handled for frequent service stopping, high electrical and mechanical maintenance can be expected and the limit switch installation as a whole may deteriorate, and fail as a safety device.

The above sums up to cooperation: the Engineering Department to insure good design, the maintenance men to keep the equipment in good operating condition, and the operators to use it for the purpose intended. This will keep the hook blocks on the crane where they belong.



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# MINING INDUSTRY

**As presented in the Mining Sessions of the 1948 National Safety Congress**


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**Volume 18**
**Transactions**
**1948 National Safety Congress**

NATIONAL SAFETY COUNCIL
Earl Creer Drive, Chicago 6, Ill.

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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE MINING SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Mining Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Mining Section carries on in behalf of its members, and for the benefit of accident prevention work in the mining industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of mines. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on pages 54 and 55 of this volume.

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# What the Bureau of Mines Does for Mine Safety

By J. J. FORBES
Chief, Health and Safety Division, Bureau of Mines, U. S. Department of Interior

The Health and Safety Division of the Bureau of Mines comprises three branches, safety, coal mine inspection and health. These branches, functioning in related fields, are coordinated and directed by the office of the chief of the division in Washington, D. C.

Laboratories and training headquarters are in the Bureau's building in Pittsburgh. Field activities, which are the major function of the Division, are carried on from 21 field offices located in centers of mining or mineral activity throughout the United States and Alaska.

The Safety Branch, employing approximately 120 engineers, safety instructors, and technicians, has as principal activities:

First aid and mine rescue training.
Accident prevention training; metal, nonmetal, metallurgical, and petroleum laboratories.
Routine dust and ventilation surveys at metal mines.
Conferences with mine and plant officials on safety problems.
Promotion of safety organizations and addressing safety meetings.
Preparation of reports for publication.

The Coal-Mine Inspection Branch, employing approximately 350 mine inspectors, engineers and technicians, has as its chief activities:

Inspection of coal mines (11,000 mines).
Routine dust and ventilation surveys at coal mines.
Accident-prevention training, coal mining.
Attendance and talks at safety meetings.
Conferences with mine officials and miners safety committees relating to mine safety conditions.
Rescue and recovery operations.
Preparation of reports for publication.

The Health Branch, employing approximately 45 chemists, engineers and technicians, has as general activities:

Health and sanitation studies in mines and mining communities.
Research in physiological effects of gases and dusts.
Analysis of air samples for Coal Mine Inspection and Safety Branches.
Testing and development of respiratory protective methods and devices.
Preparation of reports for publication.

From the earliest period of the existence of the Bureau of Mines one of the main objectives of the Bureau's work was the prevention of loss of life and limb and the protection of the health of those who make available the mineral products vital to the life and progress of this country.

During the years that intervened since the Bureau of Mines came into existence in 1910 the Bureau has consistently and continuously conducted an educational campaign aimed toward fulfillment of the objectives mentioned.

Through a period of 38 years the Bureau has been a partner with the mining industry in making working conditions and working practices safer and more efficient. The Bureau has been a research division to find the hazards responsible for deaths, injuries, and loss and to devise ways to overcome those hazards where they were not already known. The Bureau has been a recorder and reporter of the failures and successes year by year in eliminating accidents and injuries, it has been a promoter of safety programs and methods and an instructor to bring detailed knowledge of safe methods to officials and miners. At the present stage of progress our duties are being handled in the following ways, some or all of which are known to each of those in this group.

*Coal Mine Inspection Branch*—As a consequence of disastrous mine explosions in the year 1940, more effective measures were demanded in Congress, and legislation directed greater attention to the prevention of explosions and other causes of deaths and injuries in coal mines.

Federal coal mine inspection was inaugurated in 1941 by an Act of Congress, Public Law 49. Under the provisions of this act, the Secretary of the Interior, acting through the Bureau of Mines, is authorized and empowered to make necessary inspections of coal mines, the products of which regularly enter interstate commerce or the operations of which substantially affect commerce. One of the objects of these inspections is to obtain and disseminate information relating to health and safety conditions in such mines. To carry out the duties of the Bureau under this act, the Coal Mine Inspection Branch of the Health and Safety Division of the Bureau of Mines was organized in 1941. Actual inspection work was begun in December 1941 after inspectors had been employed and trained.

Coal-mine inspectors, *mining*-explosives engineers, mining-electrical engineers, and mining engineers of the Branch are selected from a Civil-Service Register. New employees are given an intensive course of training in inspection procedure and Bureau policy at the Pittsburgh Station before being assigned to field headquarters. New coal-mine inspectors are required to accompany a trained inspector until they are capable of inspecting mines unaided. An inspector is not permitted to inspect any one mine more than twice in succession. This procedure helps to assure that inspectors are not inadvertently overlooking unsafe conditions or practices.

Following seizure of the bituminous coal mines by the Government in 1946, the Krug-Lewis Wage Agreement provided for the promulgation of a Federal Mine Safety Code. The agreement was administered by the Coal Mines Administration, and during its existence, compliance with the provisions of the code was mandatory. The Wage Agreement between the mine operators and the United Mine Workers of America stipulates that there shall be prompt compliance with the recommendations of federal inspectors for elimination of reported instances of non-compliance with the code. Provision is made for appeal to the Joint Board of Review whenever it is felt that compliance would cause irreparable damage or great injustice.

By the Anthracite wage agreement of July 1948, inspectors of the Federal Bureau of Mines make periodic investigations of the mines and report to the mine management and the United Mine Workers of America any violations of the Federal Safety Standards.

The anthracite safety standards were prepared by the Bureau in 1948, a revision of earlier standards under which anthracite mine inspections had been made since 1942.

The standard procedure for inspecting all coal and lignite mines is as follows: The inspection of a mine may require from a day to several weeks depending on the size of the mine, the thickness and pitch of the coal beds, the system of mining, degree of concentration of working places, prevalence of hazardous conditions and practices, and other conditions. The inspectors are required to inspect the surface plant, every working place in the mine, all active haulageways and travelways, entrances to abandoned workings, accessible old workings, airways, escapeways and other places where men work or travel or where dangerous conditions may exist.

When an inspector observes unduly hazardous conditions, he informs the local mine officials, and if prompt action is not taken he so advises the Bureau supervising engineer or engineer-in-charge, who notifies the head of the appropriate state inspection service, the local state inspector, or the head of the mining company by telephone or immediate personal call as the exigencies of the conditions may warrant. The mine safety committee is also notified of the conditions and the action taken.

Immediately following the completion of an inspection, the inspector confers with the company officials and informs them of his observations and recommendations, thus avoiding misunderstandings. Similar conferences are also held with miners, safety committeemen, where committees are functioning.

A preliminary report, covering unsafe conditions and practices considered to be of primary importance, is prepared by the inspector and posted by him at the mine, within one day following the completion of the inspection. Copies of the preliminary reports are distributed from the field offices of the Bureau of Mines to the mine officials, the state mine-inspection service, district and national offices of the mine workers organization, and to others.

A final report contains a general description of the property and of conditions and practices observed during the inspection. Each unsafe condition and practice is recorded in detail, and proper recommenda-



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tions are made to correct them. Results of analyses of dust and air samples are listed in the report.

If the report indicates that disaster hazards existed or were developing at the time the mine was inspected, a special letter calling attention to such hazards is sent promptly to the president of the mining company by the Director of the Bureau of Mines or by the chief of the Health and Safety Division. A similar letter is also sent to the head of the state mine-inspection agency, having jurisdiction over the mine, by the proper field officials of the Bureau of Mines. This procedure was adopted in an attempt to enlist the cooperation of the responsible state authorities in reducing or eliminating the hazardous conditions and practices in the mines, particularly those that may result in a mine explosion or mine fire.

Inspections of coal mines under the Coal Mine Inspection and Investigation Act were started on December 1, 1941. From that date to June 30, 1948, 18,158 complete Federal inspections of all types of coal mines were made. These represent both original and reinspections of 4,119 separate mines. In each of the past 2 years about 400 mines were inspected for the first time, and 4,100 reinspections were made.

Under normal conditions, approximately 11,000 coal mines (underground and strip) are operated throughout the year in 31 states.

Virtually all of the sizeable mines, and a fair number of smaller ones, have been inspected.

The following data indicate the number of coal mines (bituminous and anthracite) in which major improvements listed were made:

| *Improvement Item* | *Number of coal mines in which improvements were made.* | | | |
|---|---|---|---|---|
| | 12/1/47 to 6/30/48 | 7/1/46 to 6/30/47 | 7/1/47 to 6/30/48 | 12/1/41 to 6/30/48 |
| a. Use of black blasting powder discontinued | 191 | 221 | 160 | 572 |
| b. New main fan or fans installed | 398 | 318 | 295 | 1011 |
| c. Ventilation improved in face regions | 1369 | 1228 | 975 | 3572 |
| d. Use of blower fans with tubing discontinued | 155 | 130 | 60 | 345 |
| e. Preshift examinations for gas inaugurated | 303 | 473 | 541 | 1317 |
| f. Onshift examinations for gas inaugurated | 414 | 444 | 356 | 1214 |
| g. Water used to allay dust in face regions | 230 | 176 | 153 | 559 |
| h. Use of rock dust adopted for first time | 193 | 425 | 349 | 967 |
| i. General improvement in rock dusting in mines previously rock dusted | 349 | 771 | 824 | 1944 |
| j. General improvement in haulage practices | 1655 | 716 | 531 | 2902 |
| k. Method of systematic timbering adopted | 547 | 335 | 248 | 1130 |
| l. Second opening provided | 160 | 141 | 64 | 365 |
| m. Smoking discontinued | 142 | 287 | 215 | 644 |
| n. Use of lights discontinued | 262 | 190 | 168 | 620 |

The Coal-Mine Inspection Branch is engaged in the training of mine officials, mine safety committeemen, and individual miners in safety methods and procedures through special courses of instruction designed for this purpose. At present, 22 men who are qualified mining engineers or who have had a substantial amount of experience as Federal coal-mine inspectors are assigned to this work.

Two separate courses of instruction have been provided. One is the Coal-Mine Accident-Prevention Course designed primarily for supervisory officials, and the other is the Safety Course for Mine Safety Committeemen designed for persons who have had little or no technical training in coal mining.

The Coal-Mine Accident-Prevention Course consists of 40 hours of actual class work covering the following subjects:

Accident statistics as an aid to the prevention of accidents.
Accidents from falls of roof and coal.
Accidents from hoisting and haulage.
Explosions and fires.
Explosives accidents.
Electrical Accidents.
Miscellaneous Accidents.

A complete published text covering the subjects of the course has been provided, and all instructors are furnished with small galleries for demonstrating coal dust explosions, gas ignitions caused by arcs and sparks, and for demonstration and practice in testing for gas and oxygen deficiencies with the flame safety lamp. A large selection of projection slides are also available and are being used by the instructors to illustrate the course.

The instructors, however, do not rely fully upon the published text material. Each instructor is required to spend sufficient time underground at the mine in which his class members are employed so that he can correctly adapt the course to local conditions.

The classes are held in the mining communities at central locations where it may be convenient for officials of several mines to attend.

The necessity for the safety course for mine safety committeemen developed as a result of the inclusion in the National Bituminous Coal Wage Agreement of a provision for the establishment of mine safety committees composed of miners at each mine. These committees are authorized to inspect the mine for violations of the Federal Mine Safety Code, to investigate hazards reported to them, and make recommendations to management seeking to correct hazardous conditions.

The safety course for mine safety committeemen consists of 20 hours of actual class work covering essentially the same subjects as are covered in the accident prevention course for mine officials, although in somewhat less detail. This course also lays considerable stress on the provisions of the Federal Mine Safety Code, so that each person taking the course will be familiar with the code when the course is completed.

This training work among mine officials and employees affords the Bureau of Mines an opportunity to disseminate information, based on its experience gained through many years of safety work in mining, directly to those most likely to benefit by it.



Year after year falls of roof and coal have consistently been responsible for half the total fatalities in the coal mines of this country. Despite the efforts put forth by the industry, state agencies, and the Bureau, the percentage of fatalities from this type of accident has not diminished appreciably and has influenced an all-out effort to improve the situation.

In the course of investigations on roof control by mining engineers of the Coal-Mine Inspection Branch the suspension-type roof support was borrowed from the metal mines in Southeastern Missouri. During the fiscal year 1947-48, through the cooperation of several operators, and the state mining departments, this method was adapted to coal mines in the states of West Virginia, Pennsylvania, and Alabama.

In a few localities this type of support has been standardized and is now past the experimental stage. It is a wide departure from the conventional methods employed in coal mines and other metal mining districts, and its success is revising to a large extent the mining man's basic concept of roof support. It is hoped that research now under way will lead to the solution of several new problems of stress distribution presented by this technique. Special equipment is being developed for this work, including a boroscope for taking photographs of rock formations in drill holes.

Special studies with respect to mine ventilation were initiated during the year. One such study was conducted to determine the minimum volume of air that should be circulated through the last open crosscut of any pair of entries to provide maximum safety and efficiency. During the previous years a volume of 6,000 cubic feet a minute was used as a standard by the Bureau of Mines. Recently the mine operators questioned the need for this volume of air under all conditions and the Joint Industry Safety Committee (operating under the National Bituminous Coal Wage Agreement of 1947) requested the Bureau of Mines to determine the minimum practical amount needed for maximum safety and efficiency.

Coal-mine inspectors have used long-established methods of collecting samples of mine dust, and for years these samples have been analyzed by quantitative analysis

in the Bureau's laboratories at Pittsburgh. This procedure has been considered to be the most exact known but is time-consuming and fairly expensive. In February 1948 engineers of the Coal-Mine Inspection Branch were assigned to make a study to determine some improved and simplified means of collecting samples and of determining the incombustile content of each sample at the time the sample is collected.

The mining-electrical engineers of the Coal Mine Inspection Branch conduct special electrical surveys of coal mines. The purpose of such surveys is to call attention to unsafe electrical installations and practices and to recommend means of improving safety and efficiency.

Mining-explosives engineers of the Branch conduct special investigations with respect to the safe storage, transportation, and use of explosives and blasting devices. They also make regular explosives surveys of coal mines to point out unsafe installations and practices and to recommend means of improvement.

The Coal Mine Inspection Branch is functioning to bring about all feasible improvements in safety in coal mines. Every practical means is being used within our power, and this includes fundamentally the greatest measure of cooperation it can give to the management, the workers, and state mining departments.

*Safety Branch*—The Safety Branch has long specialized in the instruction of workers in the mineral industries in first-aid, mine rescue work, and accident-prevention. Investigative and educational work is conducted in varied fields of the industry jointly with engineers and inspectors of the other branches.

An important feature of the work of the Safety Branch is the giving of instruction in methods of first aid and in the use of mine rescue apparatus. During the fiscal year ended June 30, 1948, 28,413 persons employed in the mineral and allied industries were given a full course in first-aid to the injured and 2,435 in mine rescue methods or a total of 30,848.

Since the founding of the Bureau of Mines on July 1, 1910 until June 30, 1948, 1,615,064 persons have been trained in first-aid and 90,425 have been trained in mine rescue or a total of 1,705,489 persons have received training in one or both. These persons have been employed in the following industries; coal mining, metal mining, cement quarrying, metallurgical, rock tunneling, petroleum and natural gas, and nonmetallic mining such as mica, fluorspar, and others.

First-aid and mine-rescue contests were conducted at 44 places in 9 States during the fiscal year; 529 teams participated and approximately 41,365 spectators attended. One hundred and twenty-five exhibits and demonstrations were held in 18 states. Sound motion pictures on safety subjects produced by the Safety Branch were shown at 195 exhibitions for persons in the mineral industries. The Metal-Mine Accident Prevention course for metal miners was first offered in November 1941. From November 1941 to June 30, 1948, 2,748 persons completed the course and 1,004 partially completed it. Included in these totals were 787 persons who completed the metal-mine accident prevention in the fiscal year 1948 and 293 who partially completed it. The petroleum-gas accident prevention course designed primarily for persons in official capacity in the petroleum and natural gas industries was instituted in 1939 and to June 30, 1948, 1,508 persons completed the course and 2,278 others partially completed it. Included in these totals are 112 persons who completed this course in the fiscal year 1948 and 429 who partially completed it.

Engineers of the Safety Branch presented the lecture and demonstration on flammability of gasoline vapors titled, "The Magic of Fire." During the fiscal year 1948 the lecture and demonstration was presented at 93 safety meetings in 19 states at which 13,491 persons were in attendance.

Special investigations on safety conditions and hazards included metal mine safety inspection, effects of use of diesel locomotives underground, dust and ventilation surveys, inspections of sealed fire areas in mines, fire-and explosion-hazard surveys in oil plants, and tests of safety and electrical equipment for the Navy.

Ninety-one publications and papers covering a wide range of technical and educational subjects were prepared for presentation at meetings. The electrical-mechanical section makes tests and issues approvals on electrical equipment designed for use in coal mines. Permissible equipment for almost every need is now available for use in mines.



*Health Branch*—The activities of the Health Branch are directed toward the control of harmful or hazardous exposures and to the improvement of hygienic conditions in the mineral industries. In the past year such investigations and recommendations were made on conditions in coal mines, a zinc smelter, a carbon black plant, diesel locomotives underground, and ventilation and air conditioning equipment in metal mines. Laboratory investigations were made dealing with the concentration and composition of dust, performance of gas-indicating instruments, toxic gases produced by burning synthetic resins, explosions in compressed-air lines, analysis of acid mine waters, and various other subjects.

In the gas and dust laboratories, 15,000 samples of gases and dusts were analyzed. Gas and air samples were those taken in connection with inspections of mines, investigation and recovery operations after mine fires and explosions, and investigations of various hazards and conditions encountered in the mineral industries and the military services. Dust samples were those collected in field investigations and in laboratory studies relating to the evaluation and control of explosion and health hazards in the mining industry.

Field investigations included a survey of the possible hazard from excessive use of quartz sand in operating mine locomotives. The hazard was found to be negligible. Similar tests on dusts produced by use of shuttle cars were made in another mine.

Black or carbonaceous slates encountered in iron and other metal mines sometimes heat spontaneously, causing repeated mine fires. Laboratory studies are being carried on to determine the combustion characteristics of the black slates and the nature of gases given off in such fire areas while sealed. The purpose of the investigation is to obtain information that can be used in interpreting the results of the analysis of air samples collected from actual sealed areas.

Tests of approved types of dispersoid filters and gas-mask canisters were run to check the quality of those being sold to users under Bureau approved labels.

The work of the joint investigation conducted by the Bureau of Mines and the bituminous coal industry on acid mine water drainage is being reported in four reports of investigations soon to be issued.

The growing importance of industrial hygiene in the mineral industries is being given more attention in the work of the Health and Safety Division each year. As an example, a number of field engineers of the division were given training by experts in the Health Branch on methods of control and determination of unhygienic dusts. Thus, each district office was assigned a qualified dust "expert" to work on studies of atmospheric dust in mines.

The foregoing brief and rapid summary of the varied activities of the health and safety work of the Bureau will show the multitude of problems and still growing importance of the task of accident prevention in mining and allied industries. The Bureau cooperates with units of the industries and other agencies concerned in preventing accidents in mines and plants.

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# Headsheave Maintenance Saves Wear on Ropes

By JOHN TREWEEK
Safety Engineer, Mechanical Department, Homestake Mining Co., Lead, So. Dak.

By maintaining the correct size and contour of headsheave rope grooves it is possible to increase the life and service of all steel hoisting ropes. This is more noticeable on the larger and deeper mine shaft operations where large diameter and great lengths of hoisting ropes are used, and where any unwarranted or preventable wear of the hoisting rope reduces the rope diameter below the safe operating load more rapidly, making it necessary to remove and replace the rope prematurely.

Five large hoisting units are in operation at the Homestake. They are: Ellison ore hoist, rope diameter 1⅜ inches, headsheave dia. 12 inches, Manganese steel rim; Ross cage hoist, rope dia. 1¾ inches, headsheave dia. 12 inch, cast steel; Ross ore hoist, Yates cage hoist and Yates ore hoist, rope dia. 1⅜ inches, headsheave dia. 14 feet, cast steel. The headsheave rope grooves are checked and studied every 30 days. A contour gage is used to check the condition of the groove.

All headsheaves are finished by the manufacturer with proper size groove to fit the contour of a given size hoisting rope. As the original diameter of the 1⅜ inch dia. rope is a plus ⅛ inch to ⅛ inch, a maximum of 2 inches is the allowable groove seat. After the rope is in use it will stretch and set itself to the approximate 1⅜ inch dia. The continued contact of the rope with the headsheave groove tends to reduce the diameters of both the rope and the groove. This in no way hinders the operation of this particular rope but the groove will be unsuitable for the new rope until the groove is dressed down to its original diameter.

In 1927 at the Ellison ore hoist it was necessary to replace the hoisting ropes, and the headsheaves required trimming to fit the new ropes. The sheaves could not be taken down very easily, so it was decided to build a portable rig or machine to be installed at the headframe, and to grind the grooves to standard size with the headsheave and rope in place. This operation has been since used at all the hoists whenever ropes have to be turned end for end or when new ropes have to be put in.

The design of the grinding rig is as follows: A substantial base and slide comparable to a lathe carriage with longitudinal and cross feed, capable of holding an electric motor that directly drives a 20x2½ inch Alundum grinding wheel at a speed of 1,150 rpm. with a minimum of vibration. This base is bolted to a 1 inch steel plate which rests on a structural extension of the main sheave girders. The motor is 7½ H.P., dustproof, ball-bearing type with Arktite plug and cable, which is plugged into an Arktite wall receptacle near the sheaves. A start and stop push-button switch is mounted on the motor for convenience and safety. The grinding wheel is dressed to the desired contour with a regular grinding wheel dresser. A contour template is made for shaping the grinding wheel.

The headsheave is rotated by the hoisting engine by means of the old hoisting rope in normal position, running in the sheave groove with an approximate speed of 50 feet per min. This speed is best for a 14 foot diameter sheave; other sizes will vary accordingly.

For the best results, the grinding wheel is applied into the rope groove only when the hoisting rope (with the skip or cage attached) is descending the shaft, and is withdrawn from contact when the rope is coming up. This permits grinding chips to be thrown down and clear from the rope and sheave wheel.

Before grinding operations can begin, all the rope dressing that is deposited on the sheave wheel must be removed. A nonflammable cleaning fluid is used.

The rope groove size and contour are checked with a steel circular disk which is 2 inches in diameter, maximum for 1⅜ inch diameter rope. This conforms with the standard practice as recommended by leading rope manufacturers.

The grinding operation is carried on Sundays or holidays, so as not to interfere with the operation of the mine. Usually four men are used on this operation, two for grinding and two for the cleaning job. When the rope and sheave are in motion a man stands by the signal system so that the hoisting engine can be stopped in case of an accident or trouble. The average time for trimming two 14 foot sheaves for 1⅜ inch rope is 8 to 10 hours.



# Hoisting Rope Records

By L. C. MOORE
Chief Mechanical Engineer, The Cleveland-Cliffs Iron Co., Ishpeming, Mich.

These remarks on hoisting ropes will be confined mostly to the procedure as followed by the Cleveland-Cliffs Iron Company in selecting the right kind, how they are maintained while in operation, and records kept of worn out ropes as a guide for future selections.

The first record covers hoisting ropes consumed at the Cliffs Shaft Mine, Ishpeming, Michigan, from July 11, 1905, to September 16, 1915. The ropes shown average 316,000 tons each with the two poorest, which developed two tight strands lasting only 3 months and hoisting less than 100,000 tons. The other poor records were due to a second rope being transferred from another mine and to a broken head sheave on shaft house.

For top performance, the first rope reaching over a half million tons was in 1930, and the trend was up since that time. From 1905 to 1928, the procedure was to remove the ore skips and install cages each interval during the day when the men were hoisted to surface or lowered into mine. After 1928, a combination skip and cage of aluminum was used that weighed less than the old steel skip and the daily transfers were eliminated, saving the hoisting ropes from so much handling.

About 1928, applying of rope dressing started and has continued in various forms since that time. As the ore is hard hematite, the mine ropes can be kept clean and lubricated without too much effort.

The record of skip ropes at the Negaunee Mine, Negaunee, Michigan gives the average tonnage from 1906 to 1938 as 240,000 tons and number of days in service as 446. Where the record of the best rope here is 400,000 tons, the record at Cliffs Shaft is 600,000 tons. With these discrepancies, the question naturally arises, why?

The mine is 40 per cent deeper, the load is about the same, the rope is the same diameter and construction, but where Cliffs Shaft ore is clean, this ore is a dirty, slimy, soft material that sticks to anything touched. Rope dressing has been applied since 1930, and the trend shows better performance since that time. The high point on number of days in operation is due to lack of ore demand as the ropes lasted three years, but when the ore was needed, this mine produced annually over one million tons. As ore only was hoisted on these ropes, judgment was faulty as to when they should be discarded. Sometimes, they were not changed soon enough, and a rope broke which meant the loss of a skip. The record also shows that only ropes manufactured by Bethlehem Steel Company were used after 1940, unless such ropes could not be secured. This is explained by the fact that 50 per cent of the Negaunee Mine Company is owned by Bethlehem Steel Corporation.

The average hoist record for the Mass Mine is still lower, only 128,000 tons with two highs of 450,000 tons each. The reasons for this are several—the mine is 225 feet deeper, the load in skips is 5.5 tons compared with 5.3 at Negaunee and 5.1 at Cliffs Shaft, the shaft is not in as good condition, and the ore is dirty and slimy. For several years from 1903 to 1925, only two ropes hoisted 150,000 tons, then in 1930 one exceeded 250,000 tons, and by 1938 almost 450,000 tons were recorded. Since 1941, most of the ropes have exceeded 250,000 tons. This improvement is laid to closer attention to cable condition, a better method of applying rope dressing, and heavier hoisting schedules. The manufacturers, through their research departments, may be giving us better cables. Some of the low records show that the

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cage hoist rope at the Athens Mine was removed as soon as the first broken wires were observed, and the best part used for skip operation here giving an additional 50,000 tons. The hoist drum diameter of 10 feet compares to only 8 feet at the Negaunee and Cliffs Shaft Mines and should be in the rope's favor.

The Athens Mine is the deepest mine in Marquette County, 2470 feet. Its skips average 5.1 tons per trip, the rope size increases from 1¼" to 1⅜", and the hoisting drum diameter 8 feet. Under these conditions, the hoisting ropes averaged close to 100,000 tons from 1920 to 1928, then they moved up into the 150,000 ton class for the next ten years, and for the last 10 years, the average is over 200,000 tons.

From 1946 to 1948, one rope exceeded 400,000 tons and surprised everyone interested. On checking, this was found to be of the following description—1¾", 6x19 "N" type, glavanized, improved plow steel, regular lay with hemp center and 6 filler wires, made by the Roebling Wire Rope Company. It was bought galvanized because no other cable was available at the time, and it was needed immediately to keep the mine in operation. A duplicate was purchased and is now working, but will not be worn out for at least another six months. Its present condition indicates it may give as good a performance as the first one.

A galvanized rope costs 20 per cent more than a non-galvanized of the same description. But if 100 per cent more hoisting load can be secured, they are the most economical to use. One is also being tried at the Maas Mine to check for longer life there.

The last slide on hoisting rope is rather short on record as it covers the Mather "A" Mine at Ishpeming, Michigan, which started in 1943. Only 3 ropes have been discarded. Two had a record of close to 800,000 tons, while on the third, a flaw developed and it had to be removed at about 350,000 tons. As this mine belongs to the Negaunee Mine Company, Bethlehem Steel Company supplies the ropes and have shown much interest in specifying not only the proper rope, but its method of application.

Specifications on the rope are as follows: 3300 feet, 1⅜" diameter, 6x27 Type H purple strand langlay, right lay, hemp center, flattened strand. It has a breaking strength of 330,000 pounds and weighs 6.4#/ft.

Instructions received for installation from Bethlehem Steel Co. are as follows: "After the new rope has been attached to the skip, it is to be lowered slowly to the bottom (2350 ft.) and raised again to surface without load. The skip will then be lowered to the 6th level (2200 ft.) where it will be loaded from pocket. The skip will then be run slowly to the bottom, then to the collar, and the load dumped, then lowered back to the 3rd level (1750 ft.). The skip will then be set on timbers and the rope brake installed. The rope is then to be allowed to uncoil slowly until all of the twists have been taken out of it at the 3rd level elevation. The rope will then be attached to the skip and the skip lowered to the bottom to redistribute the balance of the twists after which it should be ready for normal operation."

During the last five years operation, steel guides of 85# railroad rail have received wear due to rope twist in one direction. On the present order for hoisting rope, the specification has been changed to left lay instead of right lay to keep equal wear on these rails. We are also testing 12" rubber tired wheels on our skips to replace wearing shoes and hope to eliminate guide wear in this way.

Experiments over the last few years have uncovered the most economical way to apply dressing to hoisting ropes. In the past, the use of heavy dressing that required heating and a trough to apply proved too costly for the additional life derived from the rope, but with the use of a new machine, one man can dress the rope in 15 minutes with about 1¼ gallons oil, and it is found that such a dressing applied every 3 days is ample. This oil is called Liquid Light Rope Dressing as made by Wadams Oil Company. Other oil companies make dressings of a similar nature. To run comparative tests on all requires too much time, but from the few tests run, it is felt this material keeps the rope lubricated outside as well as internally. Most of the machine for applying the dressing is made at the mine and depends on compressed air to give the hoisting ropes their proper dressing without waste.

Our company is pleased with the fact that improvements are being made in hoisting rope records, but it would be more pleased if twice the tonnage could be secured. Our sheaves are kept with the right rope curvature by using a steel insert that can easily be replaced, fastened by bolts in the cast iron rim. The idler sheaves have rubber inserts, eliminating any chance for wear from them. The 1⅜" ropes at the Mather Mine required steel head sheaves, but no wear can be observed on them after four years operation.

Some critics feel that the rope speed is important. At the Cliffs Shaft, the rope speed is 1000 ft./min., at Negaunee 1500 ft./min., at Maas 1500 ft./min., at the Athens 1500 ft. with 2400 ft. at the Mather "A" Mine. Where the guides are not in exact alignment due to shaft sets shifting, it has been found necessary to slow the skip a few hundred feet per minute to eliminate excessive shaft maintenance, and this must have some effect on the rope. It has also been found that the skips run smoother by increasing the length of the skip cradle which naturally brings the wearing shoes further apart.

We feel that rubber tired wheels used on each end of skip frame to eliminate guide shoe wear should improve conditions, but tests run so far have not given us conclusive proof. We are still experimenting and researching with the hopes of securing the complete answer sometime in the near future. The new development of equipping hoisting ropes with a nylon covering for additional protection may have some merit. It is understood that such ropes are now under test, but no definite information is available at present. The only objection I could offer is danger in case of fire. If a nylon covering can be made fireproof or even fire resisting, it would be more desirable.

Our central safety committee, consisting of all mine superintendents, district mine captains, and top representatives of mechanical, electrical, mining, and safety departments, meet once each month to discuss all mine accidents for the previous month to determine what ones can be eliminated in the future. This committee has made up sets of safety rules for employees to observe on surface and underground. As we are discussing hoisting ropes, you may be interested in these rules which are as follows:



1. Ropes used for hoisting or lowering men or materials shall be composed of steel wire, with a factor of safety determined by the chief mechanical engineer.

2. At mines where cage and skip ropes are the same size, a new rope shall be used on the cage if the cage rope has been in service more than six months.

3. Every rope for hoisting or lowering men or materials shall be securely fastened to its drum and when in use shall never be fully unwound, but at least two full turns shall remain on the drum.

4. The further end of the hoisting rope shall either be securely fastened within a tapered socket or else it shall be bound around an oval thimble and then fastened to itself by not less than six clamps or bolts. The "U" bolts of clamps shall be on the short end of the rope.

5. All ropes fastened by sockets shall be cut off and re-socketed whenever deemed necessary by the chief mechanical engineer.

6. Every hoisting rope shall be lubricated from end to end at least once each month with a lubricant approved by the chief mechanical engineer and shall be applied according to his instructions.

7. New rope or cable shall supersede an old rope or cable either when the number of breaks in any running foot of said rope exceeds ten per cent of the total number of wires composing the rope, or when the wires on the crown of the strands are worn down to less than one-half their original diameter or when the specified inspection provided for in these rules shows marked signs of corrosion.

8. The mechanical department together with the superintendent and designated rope inspector shall decide when a hoisting rope shall be discarded.

9. Hoisting ropes between the hoisting drum and the wall of the engine house and the outside of the engine house shall be guarded to a height of seven feet.

10. All ropes must be inspected once in every 24 hours by some competent person designated for that purpose by the superintendent. If upon such inspection the hoisting rope or cable is found to be below the requirements it shall be discarded for such purposes forthwith.

We follow these rules to the letter and so far have eliminated any serious accidents due to hoisting ropes.

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# Safety in Open-Cut Mining

By W. R. WEBB
Benson Mine, Jones & Laughlin Ore Co., Star Lake, N. Y.

Open pit mining can be divided into the following divisions.

1. The Stripping Operation
2. Drilling
3. Blasting
4. Loading and Hauling
5. Crushing and Conveying

As we consider each division of our open pit mining and the processing of the ore, I would like to call your attention to the consideration of safety in the planning and layout of the entire operation. You will note how total mechanization has been used in practically every phase. This has eliminated many material handling hazards.

*Stripping Operation*—Stripping at Benson is a major part of the total mining operation. It includes the removal of both rock and surface from the crude ore. The surface covering the Benson ore consists mainly of glacial drift—that is, sand, gravel and boulders. The depth of this surface varies from 0 to 50 feet.

This surface is best removed in one of several methods, namely,

1. Deep layers by shovel and trucks.
2. Shallow overburden by dozer being either pushed off the ore body or piled up for shovel loading.
3. Pockets are cleared by the use of a dragline. The surface is either thrown off the ore body or loaded into trucks.

From the main Benson-Newton Falls ore body, 1,186,075 cubic yards of surface have been stripped, chiefly by the Benson mining department. Some 4,082,692 cubic yards remain to be moved.

Approximately 340,000 cubic yards of surface have been stripped by contractors from the Amoeba ore body. 260,000 cubic yards remain to be stripped.

The Benson ore body is folded in such a manner that the contact between ore and barren waste rock on the hanging wall slopes at about 60 degrees, with the waste rock on top of the ore. This makes it necessary to remove a wedge-shaped section of waste rock in order to uncover the ore beneath.

The waste rock, a hard dense gneiss containing little iron, must be drilled and blasted, handled by our five-yard shovels and loaded into trucks to be hauled from the pit. Some of this rock is put through the crushing plant and used to dress the haulage and service roads which are constantly being moved.

To date about 641,000 tons of waste rock have been removed. Yet to be moved are 10,000,000 tons.

*Drilling*—In order to remove the waste rock and the iron ore *itself*, it must be broken into a size which can be handled by the shovels, trucks and crusher. The first step is primary blast hole drilling. This is done with 42T churn or well drills, drilling blast holes nine inches in diameter to depths ranging from 35 or 40 feet to as much as 85 feet deep.

Blast holes are spaced 18 to 20 feet apart and an equal distance from the face. As many as 12 or 14 blast holes are shot in one blast.

On first cuts this drill is often cribbed up on very uneven ground adding to the difficulties of moving and servicing. Bits and water must be delivered regularly to assure a minimum of lost time.

Eight 42T churn drills are used on seven different facets.

Secondary drilling by jackhammer and wagon drills is necessary to blast any large pieces after the big churn drill shot.

*Blasting*—Loading of the blast holes is performed by a blasting crew who handle and are responsible for all explosives and all safety precautions applying thereto.

Nitramon and Nitramex are used in 9"x24" cans. Nitramon weighs 71 pounds and is comparable to a gelatine of 60 per cent. Nitramex weighs 77 pounds and is equivalent to 80 per cent. Nitramex is used where the burdens are excessive and difficult to break.

Safety is the most important advantage in using these two agents. Neither is an explosive in the accepted sense of the word since they cannot be detonated by:

1. The strongest of commercial blasting caps.
2. Primacord.
3. Flame.
4. The impact of ball ammunition or of heavy steel weight. Their full blasting strength is developed by the use of suitable primer.

Additional advantages are:

1. They are packed in sealed metal containers so that their water resistance is unlimited.
2. They are non-headache producing.
3. They are absolutely non-freezing.

Special primers, 7"x24", weighing 38.75 pounds detonated with Primacord, as is the practice at Benson, represents the safest possible method of detonating Nitramon and Nitramex.

These cans are lowered into the blast holes by means of a tripod positioned over the hole, pulley and rope. Holes are loaded to within fifteen or twenty feet of the top, depending upon the depth of the hole, and the remainder is filled with sand and firmly tamped.

In an effort to minimize vibration and improve breakage, a Blasting Timer, an electric timing device that controls the delay intervals between holes to within .001 of a second, has replaced the practice of using a trunk line of Primacord to fire all holes or shots. This has proven very successful. Complaints of blasting vibrations from nearby localities have been greatly reduced.

Gelex No. 1 approximately 60 per cent strength, 1¼"x8" size dynamite fired with Primacord in place of electric blasting caps as a safety measure because of the conductivity of the magnetic ore, is used on secondary blasting of large pieces.

*Loading and Hauling*—As soon as the crude ore has been reduced to handling size and the working area cleaned up by a bulldozer, five yard Marion shovels are moved in and start loading the rock to 35 ton side dump tractor-trailer trucks which haul the material to the crusher.

The mining schedule calls for striping on daylight turn and ore hauling on the afternoon and night turns. This permits a balanced pit operation and allows time for truck maintenance.

*Crushing and Conveying*—The Benson crude ore contains about 35 per cent recoverable concentrate and 65 per cent waste material. The first step in the process is to separate the concentrate from the waste consists of crushing to a size which is suitable for handling in the concentration plant.

The ore is dumped from the ore trucks into the crushing chamber of a 54" gyratory crusher which will crush 25 gross tons in about one minute. This 54" coarse crusher is powered by a 300 H.P. motor and driven by a tex-rope drive which rotates the drive shaft. A pinion on the shaft rotates the gear on the bottom of an eccentric sleeve. The crushing-mantle shaft which is inserted in the eccentric sleeve drives its oscillating action from the rotation of the eccentric. The crushed ore from the coarse crusher is discharged over manganese steel wear plates to a grizzly with about 2½" openings. The undersize goes directly to a conveyor belt and the oversize passes through a hopper to one of two 18" secondary gyratory crushers. The other 18" crusher is maintained as a standby unit.

These 18" gyratory crushers are very similar to the 54" crusher but are powered by 200 H.P. motors. When newly relined these crushers discharge at about 2½" and are permitted to wear to about 4" before rebuilding.

The crushed rock is discharged to No. 1 conveyor belt to join the grizzly undersize which bypassed the 18" crusher. This material is then conveyed to two flights of 36" belt conveyor, each containing 750 feet of belt to one or both of two 500 ton surge bins which act as temporary storage for the fine crusher.

The fine crushing plant consists of two 7 foot Symons short head crushers, each driven by a tex-rope drive and a 300 H.P. motor, two rod-deck screens to permit the fine material to bypass the crushers and a dust collecting system.

The ore from the two surge bins is fed by pan feeder to 36" conveyors known as 3A and 3B and conveyed to the fine crusher building and discharged directly to the rod-deck screens. These screens contain ¾" wide openings which allow the fine ore to



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by-pass the fine crusher and the oversized material goes to the cone crushers to be crushed to approximately ⅝".

Under our present setup the crushers discharge out 40 per cent of the product in a size above ⅝". It is planned to add a third fine crusher and put all of the crushed ore over a ⅝" screen and recrush the oversize so that all of the ore delivered to the concentrator will be smaller than ⅝".

The discharge falls on No. 4 belt which is 1450' long, thence to No. 5 conveyor, a 750' belt for transportation to the top of the concentrator storage silos. No. 6 belt which runs over the concentrator silos and over a movable tripper, permits the discharging of the fine crushed ore into either of the three concentrator bins. When the crude ore has reached this point, it has passed from the supervision of the mining department into that of the plants.

*Concentrating*—All the processing up to this point has been preparatory work for as yet we don't have a single pound of iron that is usable in the blast furnaces or bessemer convertors. It can readily be seen that efficient and economical operation is necessary to make iron ore from Benson competitive with Minnesota ore which, in many cases, needs only to be extracted from the pit with power shovels and loaded for shipment.

The concentrating process is the means whereby the iron ore is separated from the waste material or tailings. *It requires approximately three tons of crude material mined to produce one ton of ore which means that two thirds of the rock mined, crushed and processed in the concentrating plant is wasted material.*

The crushed rock is conveyed from the surge bins or storage silos to three large rod mills, each of which are 9 feet in diameter and 12 feet in length. These rod mills are charged with 4" steel rods which grind the rock as the mill revolves rapidly. The rock is ground into fine particles very similar to sand and is elevated to the rougher magnetic separators of which there are nine.

In each separator an inclined endless belt, driven by pulleys at either end, moves rapidly through a three compartment tank. The belt dips slightly beneath the surface of the water in the tank. Powerful sprays of water bathe the belt as it passes through each compartment. The lower section of the belt is held closely against a battery of powerful electric magnets. As the ore pulp is fed into the machine from the tank on the upper deck, it is forced up against the rubber belt by the water sprays.

The magnets behind the belt take firm hold of the magnetic ore minerals which cling to the belt as it moves through the tank. Powerful sprays of water play against the film of magnetic minerals and wash it free from the non-magnetic gangue minerals which then settle to the bottom of the tank. The waste material pours from the bottom of the tank and the sludge-like waste is pumped out of the concentrator and across the highway to the tailings basin.

The magnetic material is held to the belts in the separators until it has passed the battery of magnets then it falls away from the belt onto a short slide which conveys it to a noisy vibrating screen. The oversize material from this screen is returned to the main floor of the concentrator, charged into the ball mills and reground before being returned to the circut to retrace its course through the magnetic separators.

The material which passed through the screens is piped into one of the magnetic separators on the lower deck where, going through an identical process, it is further cleaned of waste material. The product from these "cleaner separators," as they are called, is piped to great open rotating drums or filters which suck the water out of the concentrate pulp and deposits the partially dried product on a conveyor. After being weighed, a series of conveyors carry the concentrates to the sinter plant storage bins or dump it directly into railroad cars for shipment to the J & L steel plants.

*Sintering*—The fine grinding of the Benson ore which is necessary to free the ore from the gangue minerals makes the concentrate too fine to be suitable for the blast furnace, so further treatment of the Benson product is needed. At the Benson Plant and at the J & L Steel Producing Units, Benson concentrates are sintered to weld the product into material of adequate size for blast furnace use.

The sinter plant is the largest of the Benson plant buildings. Adjoining it are large storage bins for both ore concentrates and fine anthracite coal. A long belt conveyor carries the material from these bins up to the sinter machine. Measured amounts of fine coal and ore concentrates are discharged onto the conveyor in the dark tunnel beneath the storage bins. Passing up into the sinter plant these fine materials form a protective layer on the conveyor belt onto which hot fine sinter returns are dropped.

Passing under the complex machinery of the plant the belt with its triple load of coal, ore and sinter returns climbs steadily to the top floor of the sinter building where it discharges its load into revolving barrels. In these "pug mills" the three constituents are thoroughly mixed.

Here in a long high room stand the sinter machines. Below the "pug mills" the mixed coal, concentrate and sinter returns are spread onto an endless belt of steel pallets which form a slowly moving table passing beneath the ignition furnaces. The huge rectangular furnaces with yellow flame blasting from their open bases ignite the coal in the 8/16" bed of mixed materials. Behind the furnace a man sits before a battery of recording meters, push buttons and switches which govern the action of the giant machine. In front of the furnace the table moves slowly forward toward its end 100 feet away.

Powerful fans suck air down through the charge and insure complete combustion of the coal. The glowing surface of the table changes from cherry red to dull gray as the charge is burned through and approaches the end of the belt where each segment of the table tips and with a mighty crash spills its load, still fire red nearest the pallets.

The hot sinter slides across a coarse bar grate, which separates out the fine return materials, directly into waiting railroad cars. The cars are constantly sprayed with water to cool the clinker-like sintered product before it is weighed on the track scale and starts its trip from the mountains of Northern New York to the J & L blast furnaces.

*Statistics*—The final product of this long and complicated series of operations is a high quality bessemer sinter averaging about 64 per cent iron, 5 per cent silicon, .025 per cent phosphorus, .032 per cent sulfur, and .35 per cent manganese. Some of the advantages of Benson ore are its higher iron and lower phosphorus content.

In 1947, over 650,000 G. T. of Benson sinter and concentrates were shipped to J & L plants which means that upward of 1,900,000 G. T. of rock were mined, hauled, crushed and concentrated to achieve this production. It is proposed to expand the facilities at Benson to ultimately produce 2,000,000 G. T. of iron ore per year, about 3 times as much as in 1947.

Benson Mines employs about 575 persons and paid out nearly $1,500,000 in wages, over $2,000,000 for supplies, approximately $1,800,000 for freight and $240,000 for electric power in 1947.

To maintain the present operation rate, Benson uses 200 tons of anthracite coal and 5,000 gallons of fuel oil per day.

*Conclusions* — Before finally discussing safety there are a few conditions which have had to be considered for efficient operation and certainly for a proper functioning safety program. We do not offer these conditions as excuses but rather as difficulties which have had to be surmounted the same as any concrete production obstacles had to be removed.

The principal occupations of Star Lake and area are farming, logging, trapping, fishing, guiding, catering to summer trades, sugaring and a limited number working in the paper mills. Mining was definitely new to everyone. Every employee, including the supervisory force had to be trained to do the job. Skilled men are still non-existing within the area. Immediately following the strike in 1946, twelve new shovel operators without any experience were put on operating our shovels within one month. A necessity as only three operators remained after the strike.

Only two second class automotive mechanics returned to work. We now have a crew of between 35 to 40 automotive mechanics. All have been trained on the job, as there is no place in Northern New York except National Lead Company where the same type of experience could be secured. They are faced with the same shortage.

Unfortunately, Star Lake, as small as it is, does not offer the housing, recreational



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or shopping facilities necessary to attract families into the area. The hospital is 37 miles distance. However, a new hospital and a new central school are listed for early construction. Houses are beginning to spring up here and there. The future should hold better prospects in this respect.

Most of our employees travel long distances to work. Some travel as far as 40 miles each way. Our absenteeism and turnover are relatively high. Cars break down. Employees lose their rides and are forced to quit.

Within the two years time since J & L purchased the plant, we have had 750 separations or almost 200 more than our total payroll today.

A bus line from Gouverneur, established within the past year, has helped materially in reducing our turnover.

Benson operates the year round. Deep snows, sleet storms, sub-zero weather and short daylight hours add considerable hazards. Special provisions and care of equipment are necessary. For example, a special thaw shed building had to be built to thaw out the coal for the Stater Plant in order to unload the cars. Even with these facilities sometimes several days are required to thaw them out.

The extreme cold weather lessens the tensil strength of steel. Booms, dippers, sticks, etc., break with ease adding to the hazards.

Continual expansion of the operation does not lend itself to standardizing crews, practices, etc. Future expansion, some of which I have mentioned, means an additional 150 to 200 more employees within the next few years.

In considering these conditions, I believe you have the key to any success we can claim in our safety program—training and education. Perhaps a lot should be credited to luck. Maybe it isn't so much what we have done, but in spite of what we have done. Yet the constant nicking away by training the employees on the jobs, training the foremen on what to do and what to expect, improved methods, constant reminders by posters, or articles in our corporation monthly magazine, *Men and Steel* in which we have our own section, or at our safety meetings, reminding the employees that safety is an individual job done collectively—all these things have paid dividends.

That we have made some gain is reflected in our increased production records and steadily improved safety records.

The fall of 1946, in spite of the practically new crew and the major repair program, we won three first place awards for no lost time accidents in the 1946 Associated Industries of New York State Accident Prevention Campaign. In these contests it is our policy to divide the entire operation into three units pit, plants and mechanical. This gives each group an opportunity to win an award and permits competition within our own "diggings." In the 1946 State Insurance Fund Accident Reduction Contest for New York State, a contest conducted for the first six months of each year, Benson Mines, entered as one unit, won an honorable mention.

In the 1947 Associated Industries Contest, we had two accidents involving three employees which eliminated any chance for a good showing. However, the plant unit had only one lost time case. This accident occurred the last week of the contest.

We have just recently been notified by the State Insurance Fund that we have won the first place award in the mines, quarries, wells group in the 1948 State Insurance Fund Accident Reduction Contest for New York State. Twenty-eight units were entered in this group.

The State Insurance Fund, which is our insurance carrier, also has notified us within the past two months of a 40 per cent reduction in our rate for the coming year. This is based on our experience for the three years.

However, we are still not completely satisfied with our program. We are presently revising our program to guarantee a definite contact with each employee to permit a steady flow of information through the proper channels to him.

No discussion of safety relative to mining in New York State could be complete without mentioning the constant cooperation of the New York State Department of Labor. This department has aided materially through its factory inspectors to maintain safe working conditions and practices. Codes are continually reviewed by the state to guarantee that they are kept up to date and that they offer no hindrance to modern practices and methods.

Code No. 17 (Rules Relating to Quarries and Open-Pit) is presently in its fifth and final draft of revision. This code was out moded. Realizing this, the state, set out to revise it. Those companies engaged in open-pit mining were consulted and asked for suggestions on the best safety practices. The final passage of this code will furnish a practical, workable safety code and will give open-pit operators a modern guide post to safety.

The Bureau of Mines must be mentioned for their cooperation in promoting safety in the mining operations. Inspections of the mine, powder magazines and the operating practices are made regularly by their representative.

The State Insurance Fund through their representative who visits Benson Mines at least once a month, provides material for safety meetings, conducts inspected trips and makes recommendations.

Lastly the Jones & Laughlin Steel Corporation, safety policy has been a guiding influence in our program. This policy based upon years of experience both in plants and mines, has given us the benefit of the lessons gained through others who have been through the mill.

Admiral Morrell, president of our corporation, has emphasized the corporation safety program by stating, "If we can't afford safety, we can't afford to be in business."

Such emphasis and cooperation by the parent corporation cannot help but reflect throughout even the smallest unit of that corporation.



## Progress in a Practical Method of Voice Communication by Radio Through Soil and Strata

By E. W. FELEGY
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As early as 1920 the Bureau of Mines conducted experiments on underground communications through soil and strata. Humanitarian consideration of the plight of men entombed underground during times of disaster in mining operations, without means of communication to or from the surface, was responsible for the continuance of such experiments over a period of more than six years thereafter.

Results of the early investigations indicated that the use of radio for underground communications in mines and tunnels was impracticable at that time because of the size, weight, and power requirement of the units. Much time and effort therefore were devoted to testing communication methods other than radio for use underground, but no satisfactory method of emergency communication was devised.

Other agencies besides the Bureau of Mines, and a number of independent investigators, from time to time also have conducted experiments on communication by radio and other means through soil and strata, and the Bureau of Mines never abandoned completely its efforts to develop a practical means of emergency communication underground.

Because no suitable emergency underground-communication equipment was developed, it has been impossible to determine where miners were entombed after mine fires and explosions. This fact was emphasized in some major coal-mine disasters in recent years, when it appeared that communication between the surface and men trapped underground might have resulted in saving many lives. Improvements in surface communications in the last decade have given fresh impetus to the search for a means of communication adaptable for use by persons underground. The perfection of small personal radios, the development of walkie-

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talkies, the evolution of extremely sensitive miniature electronic tubes, and the outstanding achievements in communication methods and equipment of World War II renewed interest in the possibility of using radio underground.

Late in 1944 the Safety Branch of the Bureau of Mines resumed the study of emergency underground communications. The work was carried on under the direction of D. Harrington, formerly chief, Health and Safety Division, and S. H. Ash, chief, Safety Branch. Until March, 1946, the program was directed toward re-examining different methods of underground communication that indicated possibilities of success; since April, 1946, the work has been concentrated primarily on the application of radio to communication in mines and tunnels, because low-frequency radio seems to offer the most promise as a successful method of emergency underground communication.

Conventional telephones, sound-powered telephones, the T.P.S. system, audio-frequency communication, and the wallie-talkie system that received so much publicity during the war were tested for applicability to communication through soil and strata at mines and tunnels. Each system showed weaknesses that appear to prohibit its use for communication through the ground, so that most effort has been concentrated on the use of low-frequency radio, the system that shows the greatest possibilities for use by the mining industry.

The simplest way to visualize the mechanics of voice communication through strata by use of radio is to consider it merely as the flow of electric current between two points. In the transmitter, speech is converted into electric current and forced into the ground at the sending station. The electric current travels through the ground and is picked up at the receiving station by the radio receiver, which then re-converts the electric current to sound. That, perhaps, is not an exact scientific explanation of what occurs but as a mining man speaking to mining men, it is the easiest explanation that is understandable.

Bureau of Mines tests, as well as the tests of other investigators, show that if a measured rate of alternating electric current is put into the ground at the point of transmission, generally speaking, the lowest frequency currents travel the greatest distance through the earth before they become too attenuated or too weak to be picked up by the receiving apparatus, and consequently the higher the frequency of the alternating current the shorter the distance that current will travel through the ground.

The audio range of frequencies is considered between 15 or 20 cycles per second and 15 or 20 thousand cycles, that is, 15 or 20 kilocycles, per second. Sound waves in this range of frequencies can be detected by the human ear. In the middle audio-frequency system of communication, sound frequencies of the voice are converted to electric currents of the same frequency which travel through the ground and then are reconverted to sound waves again. No high frequencies are used intermediately as a carrier. Those electric currents at frequencies of 10,000 cycles or less are low-frequency currents compared to the frequencies of 500 to 1,600 kilocycles used in commercial radios and to the 60-odd millions of cycles used in the wallie-talkies.

Therefore, currents of audio frequencies travel through the ground much better than currents of radio frequencies—that is, they travel farther for the same current forced into the ground at the sending point, or, over the same distance they will be stronger. But, too much extra noise that cannot be blocked out without simultaneously blocking out the voice, accompanies the voice currents and interferes seriously or totally with reception of messages.

Sound waves produced from converting electric currents of radio frequencies—those frequencies above 20 kilocycles—cannot be heard by the human ear. The radio waves are used as carriers only, and desired voice sounds are superimposed on the radio waves at the sending point and taken off at the receiving point. Once these waves have left the transmitter they cannot be modulated further, and the radio frequencies can be tuned sharply to keep unwanted frequencies out of the receiver. Therefore, most of the noise frequencies that accompany audio-frequency reception can be eliminated by the use of radio frequencies.

The broadcast band, 500 to 1,600 kilocycles, cannot be used for mine communication because of possible interference with regular radio broadcasts. At frequencies above the broadcast band attenuation is too rapid and the practical distance of communication through the ground too short. Therefore, the investigation was concentrated on the radio frequencies just above the audio range and below the broadcast band.

The ideal radio equipment for use in mines is the wrist-watch type used by Dick Tracy in the comics. Some day that may be approached. Some parts of the initial equipment used for experimental purposes do not appear even to be portable because of the range of frequencies needed for testing, the great number of controls needed for experimental purposes, and the fact that the equipment was hand-made at the Bureau and component parts were added or taken off as the investigation progressed. New equipment now in use was made by a commercial manufacturer and is much less cumbersome and more portable than the original. A final unit for the actual use in mines, employing only one frequency and a minimum number of controls, would lie somewhere between the present equipment and the wrist-watch ideal.

The Bureau of Mines equipment is not something new and startling but is almost entirely a conventional radio, differing only in the fact that it employs low radio frequencies far below the broadcast band. It operates from a 6-volt storage battery or from an ordinary 110-volt outlet, depending upon the site at which it is being used. Automobile storage batteries are used so that a number of tests can be conducted without exhausting the battery, but a much smaller battery can be provided for actual mine use.

Applications of low-frequency radio to communication in mines between underground points, between underground and surface points, and in shafts and slopes were investigated at the experimental mine of the Bureau of Mines, at two commercial bituminous-coal mines and at three anthracite mines in the State of Pennsylvania, at a salt mine and an iron mine in the State of New York, and at two lead-zinc sulfide mines in Utah.

The tests of voice communication in mines, provided by amplitude modulation of a carrier radio frequency, were conducted at frequencies ranging from 33 to 220 kilocycles with the initial equipment, and at frequencies ranging from 30 to 200 kilocycles with the new equipment. The power output of the transmitter in field tests rarely exceeded 3 watts, and in most instances it was less than 2 watts.

At the experimental mine of the Bureau of Mines voice communication was achieved, probably through the soil and strata alone, through a straight-line slant distance of about 500 feet. The best results were obtained in the band of frequencies of 40 to 50 kilocycles. Borehole logs show the strata to consist of 30 to 50 feet of surface soil and clay, and shale, limestone, sandstone, and some coal.

Voice communication by radio, through soil and strata, first was proved definitely feasible in this investigation in many tests at Reliance colliery, Philadelphia & Reading Coal & Iron Company. Wholly satisfactory conversations were carried on between underground and surface stations where no anthracite beds were present in the strata between the underground and surface stations, where seamined anthracite beds were present in the strata between the two stations, and where a number of mined-out anthracite beds were present between the two stations. In addition to the beds of anthracite, the strata between the test stations consists of different thicknesses of sandstone, conglomerate, slate, clay, and a thin layer of top soil.

Voice communication was achieved satisfactorily through the soil and strata through distances up to 1,050 feet, 950 feet vertically and 445 feet horizontally, and intermittent communication through distances up to 2,040 feet. The distance through which such communication is possible probably never can be increased by improvements in radio equipment.

The lowest frequencies tested were attenuated the least—in other words, were received the strongest—through the ground at Reliance colliery, but at the same time the accompanying noise interference increased at the lower frequencies. The best results were obtained at frequencies of 60 to 80 kilocycles because the ratio between signal and noise at these frequencies was the most favorable.

On the surface the terminals of the transmitters and receivers were connected to two metal rods driven into the ground. Under-



ground the transmitter and receiver terminals were connected to ground, roof, rib, rail, air or water pipes, and trolley wires, in all possible combinations, and communication was achieved in every instance.

A piece of trolley wire as short as 100 feet is sufficiently long (when suspended) to permit use of that wire as a connection to achieve radio communication through the ground. The 100-foot length of wire may be open at one or both ends, or may be part of a continuous circuit. A suspended 100-foot length trolley wire also is sufficient to permit radio communication over the power distribution system, provided, however, that the continuity of the circuit is not disrupted, although the trolley wire may be in contact with the rail at numerous points.

At Loree colliery, Hudson Coal Company, voice communication was achieved through 400 feet of soil and strata, including several anthracite beds in unmined, first-mined, and robbed conditions, in addition to different thicknesses of slate, sandslate, sandstone, and surface material. The strongest signals again were received at the lowest frequencies tested, but as at Reliance colliery, because of the accompanying noise at the lower frequencies, the best signal-to-noise ratios were obtained between 60 and 80 kilocycles, making that band of frequencies best for communication through the ground at Loree colliery. Again the radios were connected to two metal rods driven into the ground on the surface and driven into the top, bottom, or rib underground.

Attempts to talk through the ground at the Retsof mine, International Salt Company, were altogether unsuccessful. The success of talking through the ground by this radio system depends upon the intensity of current flow, and only a slight current could be forced into the dry salt and salt-bearing formations at the Retsof mine. Undoubtedly it would have been possible to talk through the ground for some limited distance, but test stations could not be established less than 1,100 feet apart, the depth of the shaft at Retsof mine where only one level is mined.

At the Harmony mine, Republic Steel Corporation, communication was established through 1,200 feet of magnetite ore. Maximum signal strength was received at the lowest frequency tested—33 kilocycles—which in this instance was the best frequency for communication because noise interference at all frequencies was negligible. At both sending and receiving stations the terminals of the radios were connected to metal rods driven into the ore body.

The tests at the Harmony mine indicated that the signals find their way into and follow the magnetite ore body. Although communication was achieved when the transmitter terminals were connected to points in the strata considerably far removed from the ore body, communication could not be achieved through the strata unless the receiver terminals were connected to points in proximity to or actually in the ore body.

The results of tests conducted within the past two months in two metal mines in Utah, the Mayflower mine of the New Park Mining Company, and the U. S. Mine, United States Smelting, Refining, and Mining Company, follow the same general trend as the results of previous tests conducted in eastern coal and metal mines.

Mineralization at the New Park Mining Company occurs in quartz veins in a highly pyritic fine-grained diorite country rock. The ore is a lead-zinc sulfide containing some silver and a small amount of gold. The fissure deposits average 4 feet in thickness on an 80° dip.

Excellent communication was established through a straight-line distance of 300 feet between transmitting and receiving stations on two different levels when both transmitter and receiver terminals were connected to metal rods driven into the ore. When one radio was moved to a higher level, so that the two units were separated by a 500-foot straight line distance, and the terminals at both sending and receiving points were connected in the ore, communication was achieved only in the lower portion of the frequency range, and the test results indicated that communication through greater distances was not feasible at that time.

As in all previous tests of radio communication through soil and strata, the strongest signals were received at the lowest frequencies and the signal strength decreased as the frequencies increased. Noise levels again were highest at the lowest frequencies, so that in most tests the most satisfactory results were obtained in the frequency band between 55 and 75 kilocycles. However, when attempting to talk through the 500-foot distance, the signal strength decreased more rapidly than the noise as the frequency increased, and the only acceptable communication was achieved at the low frequencies.

Only a small current output could be obtained when the transmitter and receiver terminals were connected to points not in the ore, and satisfactory communication could not be achieved with connections in the diorite foot or hanging walls. The fissure material had been mined out to an appreciable extent between test stations, a condition that probably had an adverse effect upon radio communication between the points at which tests were made. Additional tests will be made at this mine and it is believed that the distance through which communication will be achieved can be extended.

Peculiarly, at the New Park Mining Company, communication was not successful when the receiver and transmitter terminals were connected to points on the rails in the drifts. This condition is unique in the tests to date, and requires further investigation.

At the U. S. Mine, United States Smelting, Refining, and Mining Company, communication was established through a maximum straight-line distance of 900 feet between two levels in the mine. In all tests, maximum signal strength was received at the lowest frequencies, and the signal strengths decreased as the frequencies increased. Again the highest noise levels were observed at the lowest frequencies and the noise levels decreased as the frequencies increased.

The lead-zinc sulfide ore at the U. S. mine contains some silver and traces of gold, and the mineralization occurs as a replacement deposit in the limestone at the contact between limestone and quartzite strata. Communication at this mine was effected when the radio terminals were connected to points in the ore, points in the limestone, points on the rails in the drifts, or to combination of points in the ore, limestone, and on the rails. It was almost impossible to obtain any measurable amount of current output when the terminals were connected to points in the quartzite and no satisfactory test results were obtained when the terminal connections were made in this manner.



Test results at the U. S. lead-zinc sulfide mine did not conform to those at the Harmony magnetite mine where the signals found their way into and followed the ore body, and where it consequently was difficult to effect communication unless the terminals were connected to points in proximity to or actually in the ore body. In fact, at the U. S. mine most satisfactory communication and maximum distances were achieved when the terminals were not connected to the ore body but were connected to the limestone strata or to the rails in the drifts. The ore had been stoped out in many places between the test stations, and at other places the ore was decidedly lean, both factors probably having a direct bearing on the results. Communication can be achieved when the terminals are connected directly to the ore, and in the limited number of tests conducted it is not possible either to isolate the effect or to discount the presence of the ore when tests are conducted with terminal connections in limestone or on rail points.

In some of the first tests at an eastern bituminous coal mine, communication could not be achieved over any appreciable distance when the transmitter was set up in a very wet section of the mine. A German investigator of radio in mines also reported interference with radio communication in very wet sections of the mine.

However, in both western metal mines the atmosphere was humid and the mines were wet, and radio communication was not disrupted. In the anthracite mines, extreme wetness either in sections of the mine at which test stations were established or in the strata between the underground and surface stations, did not interfere in any instance with radio communication through the ground or with radio communication utilizing the aid of wire or other metallic materials. The only adverse effect of the presence of water was on the equipment itself, which is not moisture-proofed and therefore develops mechanical and electrical trouble when it becomes wet or very damp.

A test was made at an anthracite mine to determine the effect of a pool of water impounded between a transmitting and receiving station. The results indicated that communication could be achieved through a body of water in a mine, but the results were not conclusive.

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Western metal mining companies evince a great deal of interest in the Bureau of Mines' radio communication experiments from the viewpoint of their possible geophysical applications in addition to the use of radio in communication. In this investigation our efforts have been directed primarily toward the aspect of communication, and the most definite statement that can be made at this time based on the test results obtained, is that some possibility of geophysical application is indicated. The limit of distance imposed upon communication by the method now under investigation is not necessarily the same limit of distance that might apply to geophysical work, because in many tests the carrier signal can be identified readily when the voice it carries is not distinguishable. The possibility of geophysical applications affords a field for further extended investigations at some later date if such course should appear to be desirable.

Radio communication in mines, other than communication through the soil and strata, now is in actual use in different mines throughout the country. A form of wired radio in which the trolley-wire system acts as the principal part of a wire circuit for carrying the radio signals is now in use in a number of bituminous coal mines in the Eastern and Middle-western States and in a few coal mines in Utah. This system of communication, in which the dispatcher can converse with the operator of a radio-equipped locomotive while the locomotive is in motion, is an outgrowth of early experiments in the Bureau of Mines investigation.

Voice communication in shafts and slopes between the hoisting engineer and moving cages or cars was tested with the experimental apparatus and was accomplished with little difficulty through distances ranging from 366 to 4,915 feet. Other systems of voice communication in shafts are being used and have been used at different mines throughout the country, but the number of installations is limited, and it is believed that results of the Bureau's investigation indicate a simpler and more widely adaptable system for such communication.

A recent report of tests on underground code, but not voice communication by radio, in gold mines on the Witwatersrand, South Africa (17), gives results that agree in general scope but are at variance in several important details with the results obtained in the Bureau of Mines investigation.

The Bureau of Mines investigation thus far shows that voice communication through soil and strata is practical to some extent at least and that radio communications may be applied in normal mine operations to good advantage. J. J. Forbes, now Chief, Health and Safety Division, has been interested in this project since its inception, and under the active direction of S. H. Ash, Chief, Safety Branch, and the supervision of E. H. Denny, Supervising Engineer, District H, the investigation is being continued in metal, non-metal, and coal mines in the Western States. It is obvious from the foregoing discussion that many questions remain to be answered, some from the practical aspect of the Bureau of Mines and the mining industry, and some that will require attention to details from the electronics experts of radio-manufacturing concerns. It is hoped that continuation of the Bureau of Mines investigative program will yield results of real value to the mining industry.

(A bibliography of the most pertinent publications on the early work of the Bureau of Mines and other agencies is on file in the Library of the National Safety Council.)

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# Recent Procedure to Control Dust in Mine Air

By LELAND H. JOHNSON

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(The material for this paper was derived from 12 years of ventilation and dust control procedures in metal and coal mines while with the Health and Safety Service of the U. S. Bureau of Mines and with private industry in the West. The data in no way reflect the practices and procedures of the Tennessee Coal, Iron and Railroad Company with which I have recently become affiliated.)



The fundamental factors of dust control in the mining industry are not new; however, the application to individual mines or individual districts need variations in detail for doing a thorough job. Dust diseases are becoming more and more a problem for the mining industry, especially so because our mines are going deeper and spreading away from the source of fresh air, because many mines are mechanizing with its subsequent faster generation of dust, and because mine employees are becoming more health conscious than in the past.

The science of dust control has developed in recent years beyond the trial and error stage and many installations and plans in mining and allied industries are well designed and doing a good job.

*Ventilation*—One of the most important factors of a control program is ventilation. Metal miners have learned a great deal from coal mining practices in providing sufficient air at the working faces for healthful working conditions. Many mine managements have installed large exhaust surface fans, provided adequate and well maintained intake and return airways, and are coursing the air by means of numerous splits. In metal mines where heavy blasting does not allow for coursing near the active face area, auxiliary blowers with flexible tubing are used to force air within 20 feet of the face.

Many ore mines were dependent on natural ventilation for years. This was a general practice in the years previous to 1938 in most metal mine districts. For instance, in one district, air requirements were such that mechanical methods were needed, and fans of 100,000 to 250,000 c.f.m. capacity have been installed as exhaust units on the surface. This necessitated large diameter concrete-lined air raises, hundreds of concrete-block walls, cleaning up many falls in airways and required an engineering plan for anticipation of air volume requirements and resistances with relation to mine layouts and projections. Underground booster fans of 50,000 to 90,000 c.f.m. capacity are used where one or more splits require more pressure than that of the total mine pressure.

Present and future ventilation plans consist of multiple entries with double, triple and quadruple headings. Overcasts and undercasts are being constructed to eliminate ventilation doors on haulageways as much as possible. Many auxiliary blowers of 1500 to 6000 c.f.m. capacity with 12 and 18 inch tubing are used.

All phases of wall, door, and overcast or undercast construction are standardized. For instance, wall stoppings for major intake and return airways are constructed from 8" x 12" x 16" concrete blocks and then painted with sodium silicate on the pressure side. Secondary walls are constructed of 8" x 8" x 16" concrete blocks and temporary stoppings are made of either a culled galvanized sheeting or wood. In some mechanical sections, brattice cloth curtains are utilized.

In driving drifts, headings, crosscuts and raises, too much stress cannot be placed on the provision of ample area for the flow of large volumes of air at low velocities. The average area of main airways is probably less than 50 square feet; whereas, they should measure at least 80 square feet. When physical conditions permit, the headings allow for 180 to 200 square feet areas.

Velocities in main airways, from an economical standpoint, do not exceed 800 feet per minute in rough rock sections, 1000 feet per minute in straight timbered sections and 1200 feet per minute in good smooth rock sections. In face regions the velocity of air must be greater than 50 feet per minute to remove the dust fast enough so that employees can breathe air that is not charged too heavily with dust. When velocities greater than 400 feet per minute are sweeping a working face, settled dust is likely to be drawn into the atmosphere along with the dust that is produced. This prevents reduction of dust concentrations.

*Use of Water*—Various water distribution systems are in use. Their design and installation are based upon the source of the water, the distance from the place of application of the water, the acid content of the water and the proposed time of service that is expected of the system.

In a few instances, water for dust control measures is obtained from fresh-water sources on the surface; the water is conducted in pipes down the shafts or slopes to the active mining faces. This is the ideal

system and is recommended when a new mine is opened or when a completely new dust control system is contemplated. In many instances, water from underground pools or from behind dams placed in drainage ditches can be used. If a thorough search for water is made above and below a dusty section with particular attention to the altitude, a source adequate for dust control probably will be found.

A body may be found that when piped direct to the face, has sufficient head to maintain enough pressure for efficient wetting; again, a body of water may be found that can be conducted by gravity to a permanent tank near the active workings and then, by using a compressed air tap, enough pressure for efficient spraying may be obtained. When a source of water is below the active workings, a pump already in use may be utilized to pump water direct to the face or to a permanent tank installation. If no pump is available, it will be necessary to install one large enough to conduct the water required for spraying direct to the face, or to a tank from which compressed air will force the water to the place where it is needed. Even small seepages and streams of water with volumes of only one or two gallons a minute have been utilized successfully in small isolated sections where a larger quantity of water was not required.

When dams or reservoirs are contemplated, construction and site should be such that several days' supply of water can be held in reserve to take care of a temporary disruption of the intake. Permanent tank installations should be large enough to furnish all the water required for a full shift in the area it is to supply. This could range in size from 100 to 1000 gallons or more.

A portable tank car for distributing water is used only as a last resort, because it has small capacity and requires considerable handling to do a thorough job. It has a place in extremely isolated sections, where no other source of water is available and where it would be difficult or unduly expensive to pipe or pump water. The portable tank car can be elevated so that sufficient pressure can be attained by gravity flow, or a compressed air tap can be connected to the tank to force the water to the face.

In water systems, the aims have been to make the system self-sufficient and to eliminate human manipulation as much as possible. Many valve arrangements, automatic float installations, etc., are well worth the additional "first cost" expense, as wetting methods may soon be abandoned by miners if water is not always available or if any considerable amount of time or effort is required to obtain or to use water. Several companies have found its profitable to place automatic switches or line controls at the face to control pumps, air taps, or some phase of the water distribution system.

A satisfactory water spray nozzle is an important part of a dust control system. Many miners and officials have believed that merely wetting from the end of a hose or pipe and using large amounts of water, constitute satisfactory control. By this method, a working place is made either disagreeably muddy or parts of it are wet unduly and other parts are left dry. A spray nozzle should give a full cone spray; be adaptable for various operations, break the water into a number of minute particles, withstand acid water conditions, stand up under normal underground abuse, and not be excessively costly.

Both plastic and bronze in several sizes have been designed and have given satisfactory results. The cost ranges from 19 cents on the plastic to 48 cents on bronze. Water consumption varies from 1 to 6 gallons per minute and the nozzles work well from pressures of 35 to 100 pounds per square inch. The designs allow for effective wetting from angles of 10 to 60 degrees and distances from 10 to 30 feet.

The combination air water spray is used at some mines and will give the most efficient atomization by passing water through an inner nozzle and compressed air through an outer nozzle. In general, the greater the air to water ratio the finer the mist, but there is a critical figure beyond which very little advantage is gained by further increasing the air consumption. A rule of thumb is used to adjust the mist so that the air feels damp, but not wet, at a distance about five feet from the mist projector. The combination spray has advantages over water alone in that greater spraying distance can be attained, deeper penetration in muck piles is accomplished and is capable of suppressing smaller size



particles of dust. The cost of a combination air water spray nozzle is approximately $1.00 each.

Mines that have efficient dust suppression from wetting, require wetting face, roof, walls, and floor before and after blasting, periodic wetting of muck piles, sprays installed on cutting and loading equipment, and spray installations at large loading or unloading points. The most effective method to allay dust is to wet at its source. If dust once becomes dispersed in the ventilating current, it is extremely difficult to suppress and may contaminate many working faces on the same split of air.

*Dust Determination and Size Characteristics*—The maximum allowable concentration of dust containing free silica as listed by the U. S. Public Health Service for 1947 shows 5 million particles per cubic foot of air, standard light field count, for dust containing above 50 per cent free silica; 20 million for dust containing 5 to 50 per cent; and 50 million for dust containing less than 5 per cent free silica.

The most dangerous dust is said to be that ranging in size from 5 to 0.5 microns or smaller; in other words, the smaller the particles, the greater the danger, and particles of these sizes are too small to be seen by the naked eye. For comparative purposes, fog is in the size range from 5 to 50 microns, 10 times larger than the dangerous dust size, and rain is in the size range from 400 to 5000 microns or about 1000 times larger than the dangerous dust size.

The use of the midget impinger apparatus, the microprojector, and in recent years, the midget microprojector, has been adopted as a standard method for sampling dusts, evaluating dust concentrations, and measuring particle size. The methods and principles of this type of sampling and dust determinations have been in use by the Bureau of Mines, the Public Health Service, the American Public Health Association, and others for more than 20 years.

Routine collection of dust samples is necessary to determine borderline cases when it is debatable whether a control system is required. Collection is also necessary in order to have an authentic record for future reference. Even though it can be determined by visual observation whether a working face or piece of equipment needs to be controlled, sampling provides the only positive record of conditions.

After 12 years of experimentation and observation, the following conclusions have been reached regarding silicosis and the recent procedures to control dust in mine air:

1. So far as known at present, silica dust apparently is the most harmful of the dusts ordinarily encountered. Silicosis, the disease caused by breathing silica dust, is a widespread industrial hazard that is increasing and affects appreciably the death rate among mining and industrial workers exposed.

2. Silicosis is characterized by fibrotic changes in the lungs which are said to be more clearly noticeable and easier to diagnose than changes due to other dust diseases of the lungs. The dust of free silica is considered more dangerous than other dusts chiefly because the victims are thought to be more liable to contract tuberculosis than persons exposed to nonsiliceous dusts.

3. No cure is known at present for silicosis; therefore, prevention appears to be the best remedy. The Council on Industrial Health and the Council on Pharmacy and Chemistry of the American Medical Association made the following report on the use of aluminum in the prevention and treatment of silicosis in April, 1946:

"The dissemination of reports on the effects of aluminum powder in the prevention and treatment of silicosis has aroused widespread interest and a demand for an authoritative statement regarding its value. At the present time the following statement would seem to be warranted; it is subject, however, to such modification as future knowledge and experience may indicate.

"(a) In experimental animals the prophylactic use of aluminum inhibits the toxic action of relatively pure quartz.

"(b) In man, industrial dust exposures often involves mixtures of various minerals in addition to quartz, and other environmental variables to which experimental animals are not subject. Therefore, human silicosis usually develops more slowly and is often modified in type. Only prolonged unbiased observation with adequate control

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cases, will demonstrate whether the prophylactic results obtained with animals are applicable to man.

"(c) Animal experiments have demonstrated that administration of high concentrations of amorphous hydrated alumina unfavorably influences resistance to tuberculosis. While this result has not yet been reported for metallic aluminum, caution in the application of all aluminum therapy to human beings is recommended.

"(d) The use of aluminum might appear as an easy short cut to healthful working conditions, thus, saving large expenditures for ventilation and other control methods. Actually there is no substitute for the accepted methods of dust control.

"(e) If the industry indiscriminately treats all employees with aluminum dust, there may be aggravation of tuberculosis or other pulmonary conditions.

"(f) The therapeutic use of aluminum in man appears to relieve symptoms in a very small number of cases in which silicosis develops rapidly. Experience in some groups is more favorable than in others.

"(g) In view of these conditions, it is recommended that the general application of aluminum therapy in industry be delayed until adequately and impartially controlled clinical observation demonstrates its effectiveness in preventing or alleviating silicosis in man. In the meantime, there should be no slackening in the control measures that have been found effective in reducing the incidence of dust disease in industry."

4. Controlled ventilation with ample sized airways, substantial wall stoppings, use of overcasts and undercasts, auxiliary blowers, etc., is a very important phase of a dust control program in many mines. Dust will remain suspended in still air for hours, and positive air movement is necessary to sweep it from the affected areas. Ample ventilation is a must at many mines to control high temperature and humidity and remove toxic and harmful gases that contribute to respiratory disease.

5. All drilling, cutting and loading machines are usually of the wet type. The most efficient drilling machines are the side-exhaust port type and equipped with the New York backhead. Cutting machines are equipped with a water spray on the insulating bits, also a full cone spray on the return side and loading machines are equipped with fan or full cone sprays. The use of tungsten carbide bits on drilling and cutting machines aids in dust suppression, as the longer a bit remains sharp, the larger are the cuttings and the smaller the amount of fine dust that is generated. It was observed that cutting is speeded by the lubricating and cooling action of water on the bits.

6. A vigorous effort is being made to keep roadways and travelways reasonably free of pulverized material such as coal, ore, rock and traction sand. Good housekeeping helps to reduce concentration of dust produced by haulage and passage of employees, as well as the number of injuries from stumbling and falling. Some mining companies have water tank cars equipped with sprays to wet down main haulageways at weekly intervals.

7. A hose normally ¾ inch in diameter and 25 to 50 feet in length is available at each working place with the valve convenient so that the men do not have to walk far to reach it.

8. Water distribution systems have been a positive means of controlling or extinguishing underground fires. Several installations have more than paid for themselves in this way.

9. Water systems have reduced (and sometimes eliminated entirely) the hazard from fumes generated by detonated explosives. Such gases as oxides of nitrogen and hydrogen sulfide are readily soluble in water. A water spray may cause additional ventilation to move methane and carbon monoxide from a working face.

10. Visibility tests have not been made, but it was definitely observed that illumination is greatly improved, possibly as much as 75 per cent where water is used compared with instances where no wetting is done. The ability to observe roof conditions is important in mining, and water systems make it possible for miners to note bad roof conditions more readily than where dust is in the air or covers the roof surfaces.

11. Many companies are conducting periodic physical examinations, including X-raying the chests of employees. In this way, a close check is maintained on each individual, and if anyone shows signs of developing silicosis, his work can be changed before he becomes incapacitated.

12. Routine measurement of the effectiveness of dust control program by means of dust sampling, counting, analyzing, air measurements and pressure tests is being done because of frequent variations in mining practices, structure of ore or coal, and ventilation changes. These data are also necessary in order to have an authentic record for future reference.

13. Respirators are worn only as a last resort for protection in dusty atmosphere. Every effort is first made to suppress or remove the dust at its source or to remove or isolate or allay the agency that creates the dust. After a conscientious engineering effort has failed to reduce, remove, or allay the dust that is produced, then respirators are suggested for the protection of exposed individuals. Both management and employees need education in the care and maintenance of respirators when they must be utilized.

14. In general, management in the mining industry is fairly well convinced as to the desirability of dust control. Some employees are somewhat hesitant as to dust control procedures at first but soon will take every advantage of available measures to protect themselves against respiratory trouble.



## Safety in Slusher and Scraper Operations

By EDWIN J. EISENACH
*Safety Director, Climax Molybdenum Co., Climax, Colo.*

The use of slushers and scrapers in the mining industry is becoming more common year by year. It is a safe, fast and economical method when the slusher drift layout and equipment are properly designed and used. Climax has loaded approximately 27,000,000 tons of ore with slusher hoists and scrapers since 1935 suffering only one fatality chargeable to the slusher and scraper system. This occurred in 1937 when an employee attempted to operate a slusher before it was bolted down on the base. Our present methods of operation are the result of a great amount of experiment and trial, and have largely replaced the chute and grizzly system. All areas developed during recent years are laid out for slusher operations.

The following advantages of the slusher system result in greater safety as well as in increased production: a) The work is done on one level without the necessity of complicated signal systems that might break down and results in better supervision and coordination of the work. b) Approximately one-half the powder is required in secondary blasting with less dust and less explosive hazards. c) Because of the positive control of the scrapers there are less loading spills and less need of men exposing themselves under drawpoints. d) High pressure water can be used to bring in many hang-ups, thus avoiding the dangers incident to blasting. This method also generates less dust than blasting. e) Safer blasting of hang-ups as there are no obstacles to block a blaster's retreat.

The accident frequency and severity during the past 12 years show that the production of one-fifth of our ore by the chute and grizzly system resulted in 10 per cent of our total accident experience and 12 per cent of the total time lost including time charges. On the other hand the slusher system produced four-fifths of our ore over the same period with only 7 per cent of our total accident experience and 4 per cent of our total time charges. The chute and grizzly accidents averaged 648 days lost and the slusher accidents resulted in an average of 148 days lost. Runs of ore caused the larger percentage of chute and grizzly accidents while accidents occurring on the slusher system were largely mechanical and these were more easily corrected.

In all plans, designs and lay-out at Climax, safety and efficiency of operation are two factors that are considered. Our slusher drift system offers a good example

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of the results of this requirement. Although our country rock appears to be firm, it was soon discovered that the continued flow of coarse ore through the fingers and heavy blasting caused them to rapidly wear out at the brow (top of the finger-opening), causing flooding and hazardous working conditions.

Timbered sets and steel sets were both tried at the mouth of the fingers in an attempt to control this wear but the heavy blasting and run of coarse ore made it impossible to hold the sets. Concrete was then tried and proved successful. The throat of the finger is reamed out and formed for a distance of about 12 feet. The concrete in the slusher drift is at least 12 inches thick. The concrete in the fingers may be greater than 12 inches and the brow is approximately 4 feet thick to prevent breakage and aid repairs. No reinforcing steel is used as it makes a line of cleavage and hinders in repair work. Discarded haulage rails are embedded in concrete on the floor lengthwise of the drift, to provide a bearing surface for the scraper and prevent digging.

The heavy concrete wears well but has to be replaced from time to time. Some of our fingers have been reformed and concreted two or three times. When a replacement is necessary the old concrete is drilled and blasted and the finger formed for pouring. Both steel and timber forms are used. A Pomperete machine is used to place the concrete. At the beginning of this year we had placed 86,000 yards of concrete.

The slusher drifts used in the Climax mine have become standardized in size and design. Originally the slusher drifts were built on a 15 per cent incline with double fingers (fingers opposite each other). The drifts were approximately eight feet wide and eight feet high. The finger raises to the cave had no special design and were usually six feet wide and three to four feet high with an incline varying from 40° to 60°. The varying sizes and inclines were part of the experiments. With the incline slusher drifts it was soon learned that opposite fingers were hazardous, and the new slusher drifts were constructed with fingers on one side, only.

The present design uses horizontal slusher drifts entirely and we are returning to double fingers. Instead of having double ended slusher drifts, however, single ended drifts are being installed. The drifts are concreted seven feet wide by nine and one-half feet high, the fingers are eight feet wide and four and one-half feet high on a 45° incline. The slusher drift and fingers are arched in the back for strength and preventing hang-ups respectively. The bottom of the mouth of the finger is 18 inches above the floor of the slusher drift in order to allow the scraper to keep the fines cleared away and prevent their causing hang-ups and choking. The finger bottom is concreted a few feet beyond the upper end of the concrete sides and top to prevent rocks from shouldering and causing hang-ups.

The location of the slusher hoist has proved important from a safety point of view. Three locations have been used: a) Hoist over the drawhole mounted on heavy,. 54 inch side girders. b) Hoist mounted on top of the girders and a few feet back of the draw hole. c) The hoist sets 18 inches off the bottom of the slusher drift, back in the clear of the girders and draw hole. The hoist is mounted on a concrete base and anchored with eight one inch bolts. The last position has proved the most satisfactory as the operator is out of the dust area, has a full view of loading operations and is better protected from breaking cables and flying rocks. Remote control devices have not proved practical to date in our operations in slusher drifts.

There are two important guards on all hoists. One is a window framed guard with diagonal bars through which the operator watches his operations and the other is a steel plate curved over the cable drums.

Sealed-beam spot lights are provided to light the slusher drift and help the operator in following his scraper. They are mounted so they can be easily taken down when blasting by closing a V-shaped self-locking hanger that is secured to the light holder.

Signal lights are used to and from the operator to the helper spotting the cars beneath the drawhole and the operator does not see the car he is loading. All car spotters are required to wear eye protection while spotting cars because of the hazard of broken pieces of rock flying from the car when the ore falls through the drawhole.



The hoists vary from 15 horsepower to 150 horsepower. The smaller hoists are used for development and the 100 and 150 horsepower slushers are used on the production crews and the larger of the two is for long hauls. The cables accordingly range from ⅜ inch on the small slushers to 1⅛ inch on the large ones. To eliminate the hazard of men straining themselves from pulling the heavy cable, air tugger hoists are used. These are mounted on the slusher base. The 5,700 pound scrapers, used, have a folding action and close flat to be dragged back over the muck when the fingers tend to flood and stand erect when they are pulled ahead. The folding action, in many cases, prevents the breaking of cables and burying of scrapers. Six foot scrapers are used in the seven foot slusher drifts.

Blasting is a constant requirement and 90 per cent of this blasting is made necessary by hang-ups. This is our most dangerous operation and every effort is made to eliminate the cause of hang-ups. The design of the slusher drift and the finger raises play an important part in this. The ore varies in size from fines to boulders weighing hundreds of tons; in many parts of the mine the ore remains frozen the year around, thus increasing the hazards of blasting.

It is seldom considered safe to go under these rocks in hang-ups to drill them and it becomes necessary to place the powder on the sides of the rocks. This is done, either by the blaster going up to the rock or placing the bomb on a one inch by two inch stick long enough to push it into the proper position. The fuse is never spit until the blaster is safely in the slusher drift and then primacord or electric igniter chambers are used, detonating the shot or lighting the fuse. Electric blasting caps are never used in these drifts because of the possibility of stray electric currents. Concussion shots are also used in bringing in dangerous hang-ups and high pressure water is used where the fines have built up and caused hang-ups. A ¾ inch nozzle with a 500 to 600 foot head of water is used for this purpose.

The control of dust and smoke has been a serious problem and after trying nearly every possible means of control we have found that adequate ventilation is the best control and the use of sprays at areas of dust generation is an effective help. Air is exhausted at the tail end of the slusher drifts by means of auxiliary fans or through vent drifts connected with the tail end of the drift and one large fan.

The second method is the better as concussion from blasting damages the auxiliary fans. The platforms on each side of the draw holes are made of heavy screen with two inch mesh to permit fresh air to enter the slusher drift from the haulage drift. Water sprays, and air and water sprays are used to lay the dust at points of generation such as draw holes, and slusher drifts are kept wet. The sprays are used during all blasting and loading operations.

Efficiency of production and safety have improved during the years at Climax as the use of the slusher system has decreased the number of accidents in production. The larger percentage of injuries charged to the slusher system were caused by poor design of equipment and layout during the earlier years. For efficient and safe slusher operations the operator and his helper must be protected, have good visibility, adequate ventilation, and must be thoroughly trained for their jobs.

## Safety in the Non-Ferrous Smelting and Refining Industry

By JAMES H. AUBURN

Personnel Director, American Smelting & Refining Co., Perth Amboy, N. J.

The job of developing a new country from the American wilderness was a hazardous one, and a high rate of accidental injuries and deaths was accepted as a matter of course.

The non-ferrous metals industry experienced its full share of these injuries—usually with serious results due to the heavy materials handled and the hazards of this kind of operation.

During these development years, the accident experience of this industry was such that, if it were repeated today, the industry would be forced to go out of business. Frequency and severity rates ran in the hundreds and the time also must have. A management sponsored, planned accident prevention program hadn't yet been visualized.

The day did finally arrive, however, when this had to stop. Disabled manpower was much too common, and the cost of maintaining doctors and hospitals became prohibitive. Production losses caused by accidents were considerable.

The American Smelting & Refining Company pioneered in the development of accident prevention work in this industry. It is gratifying to know that others followed our lead. Planning was the key note. Processes and equipment were studied in a search for hazards. Safety education for workmen and supervisors was considered imperative and indispensable. Then the necessary manpower, effort and money were made available to turn the course of our industrial history from darkness toward the light and not without benefit to all concerned.

Frequency rates soon dropped and severity was reduced. Men could work with a lessening fear of the possibilities of injury in their daily tasks. The horse and buggy took fewer and fewer trips to the doctor and the hospital.

Coming into the last decade, we find ourselves appalled and shocked at frequency rates over 15 or severity rates over five. Prior to the last war, we were much dissatisfied with overall industry frequency and severity rates which we all recall were considerably lower than those of today.

We are all familiar with the increase in these rates in the last few years. Unpredictable *man* still works in the industry. He makes up the labor force and he is still our hazard.

Today the sources of labor are very limited and competition between industries is keen. The proportion of skilled and semi-skilled labor is indeed much greater than in the early days of our history, and these skilled people are not in great demand in the non-ferrous industry.

It has become more and more difficult to satisfy the work applicant with the kind of job he likes and wants. Rates of pay play a part in attracting labor to one type of industry and away from another. Differences in working conditions affect the direction in which labor moves to seek employment. The non-ferrous metals industry still requires and uses unskilled labor at the point of entry.

As a result, this industry in many cases is faced with the problem of employee selection from applicants who have first done their job shopping elsewhere. This is not a healthy nor helpful condition and may not be true in all areas where the industry is located, but I believe it is substantially true in most non-ferrous industry locations.

The work applicant is different from his forebear in many respects. The tension of the times has made him less stable, more excitable and nervous and as a result an ever increasing and serious safety problem.

When the attention of the public began to be focused upon the growing numbers of workers disabled or killed by industrial accidents, the first reaction was to do something to assist the victims financially, rather than to stop the accidents which were the cause of their plight. Under the common-law system, the primary basis for damages for personal injury was the employer's negligence. But even if the employer were negligent, he would still escape legal responsibility for the payment of damages if he could prove any one of his three "common-law" defenses: contributory negligence by the employee; negligence of a fellow worker; and the claim that the accident resulted from a hazard which the employee knew, or should have known, when he took the job.

Employers' liability laws were the first product of the attempt to ease the burden on the injured worker who was seeking financial recovery from his employer. These laws left untouched the ground for recovery —the negligence of the employer. Their sole intent was to modify the common-law defenses so as to permit greater ease of recovery when the employer has been proven negligent.

At the time Workmen's Compensation Laws became popular, beginning in 1911, it was felt by many people that the liability placed upon employers would develop a deep sense of responsibility and thus reduce industrial accidents by making the employer more cautious. To a great extent, this is true. Many industries, however, were already doing a fine job and were developing extensive accident prevention programs.

We must, however, be practical in our evaluation of the impact of legislation upon the accident prevention program. In some states the application and interpretation of the law has become so liberal that it is questionable if this liberal attitude helps prevent carelessness and injuries or makes men indifferent to the safety program.

The American Smelting & Refining Company, with many plants throughout the country, is a self-insuring industry where the state laws so allow. We subscribe to the policy and practice of accepting full responsibility and liability for any injured employee and strive to give him every fair and proper consideration. We give no encouragement however to the chiseler or compensation conscious employee.

What does the future hold for the non-ferrous smelting and refining industry in a further lowering of frequency and severity rates? Is there hope for much further improvement? The answers to these questions must be emphatically, "Yes."

Accident prevention work is not a unilateral effort. Management and supervision definitely need help to achieve the goal. It is management's responsibility and challenge to get that help, and it shall come only from the individual whose safety is involved. The combined efforts of management and labor are an absolute requirement before industry, as such, can approach a satisfactory frequency and severity experience—approaching perfection as closely as human effort can achieve. Unions must support all constructive efforts to prevent accidents.

During the war years in certain large war industries and particularly certain shipyards with which the speaker is familiar, the interests of the unions seemed to be limited to reporting any and all occurrences involving workmen (which could in some manner develop a claim for disability) to certain legal firms or individuals whose principal concern seemed to be the filing of claims and the collection of fees. It is encouraging to realize that many unions actively support and strive for a reduction in accidents and a safety consciousness among their membership.

How can the accident prevention goals of this industry be achieved?

If we accept the premise the employee is our focal point in the prevention of accidents, we must then plan our accident prevention program around him. This begins in the employment office where the worker has his first contact with us. In our employment procedure, the applicant usually signs various forms such as payroll deductions for union dues, health and sickness plans, participating insurance plan, the employment record and others. This is the time and place for him to sign a statement acknowledging the conditions of his employment with us. The most important of these conditions should state that in accepting employment, he agrees to abide by and willingly live up to all safety requirements of his job. He is then ready to go to work.

From this point on, the safety training of this employee contains seven steps. Some of these steps are already established in most industries and will not necessarily take extra time of the foreman. The three J's, *JMT, JRT, JIT* so helpfully used during the war years, play a genuine part in our accident prevention program. We shall recognize them as we proceed with the following outline of our program.

Let us visualize a circle divided into six wedge shaped segments and a hub in the center. We have used such an illustration in *JRT.*

*Segment #1*—Job Methods and Tools (JMT). By thorough study of the Methods and Tools used in doing a job we can find out what kind of a person we need for the job and what his instructions will be.

*Segment #2*—Selection and Placement. By careful selection of an individual and placing him on the job he is best suited for as shown by the methods and tools to be used, we reduce the chances of the worker going wrong because of improper placement.

*Segment #3*—Job Safety Training (JST). By knowing the contents, methods and tools of the job we should have a "Package" of instruction points which are



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a *must* in training the individual. The omission of a single point in the "Package" leaves the job only partially done. Job Trainers must be trained in the use of this "Package." Supervisors must insist on the whole training job being done. All safety equipment are tools of the job in this training "Package."

*Segment #4*—Job Safety Habits. This represents the safe work habits of the individual as demonstrated to the trainer and his supervisor. If the worker fails to make a habit of doing the job the safe way, he needs more training or re-training.

*Segment #5*—Job Rules, Acceptance and Agreement. This point is essential. By eliminating the negative and accentuating the positive in our training, the worker learns to know what he should do and is not confused by the numberless things he should not do. His acceptance of the rules must be had. His agreement to their necessity must be had.

*Segment #6*—Reliability and Cooperation. This point is the end result. If the preceding five points are properly covered the results should be a reliable and cooperative employee. He must be relied upon to do the job the safe way at all times even in the absence of the supervisor. His cooperation will be demonstrated in his willingness to follow instructions and to follow orders. A reliable and cooperative employee is the safe employee who does not commit an unsafe act.

*Segment #7*—This is the hub of the circle—Check and Re-check. To know if the program is working it is necessary to make constant checks and re-checks on the six preceding points of this outline. At any point where a check reveals a weakness, the supervisor must go back to that point in the circle where the failure is found and re-train, then check and re-check again.

As stated previously there is nothing new in this program. In JRT we all agreed that a supervisor gets results through people. In the seven steps described briefly in our safety program, we have taken some old tools, sharpened them quite a bit, given them added prominence and importance, put them in some semblance of order and then trained all of management and supervision in the proper use of them. We sincerely believe that this program will help us improve the record.

An understandable program, applied in the interests of that unpredictable man, the employee, plus the continuous ever driving effort referred to above, impelled by our will to win cannot fail to bring us the success that has so long escaped us.

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# Blasting Hazards in Metal Mines

By F. D. BICKEL

Technical Service Section, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Up-to-the minute information is not available, but the Bureau of Mines data covering 1931 to 1943 will do. During this period, the fatalities from explosives accidents decreased from 9.7 per cent of the total in metal mines to 4.8 per cent. This is a drop of over 50 per cent. Injuries from explosives decreased from 1.0 per cent to 0.7 per cent in the same period. Frequency rates showed corresponding reductions, so it is apparent that the combined efforts of a lot of people had some effect.

However, the actual number of deaths is still too great. Furthermore, the severity rate of explosives injuries is excessively high, as might be expected, and a study of the causes shows that these injuries were and are preventable. In other words, the accidents were, by and large, man-made and as such are still a challenge to our efforts.

I think we agree that hazards do exist in all stages of the handling and use of explosives but to a much greater extent in some than others. Figures prove that where the procedures are more closely controlled, where methods are systematized and where only a small highly trained personnel are involved, accidents are practically nil. The accident rate in explosives plants is extremely low and compares favorably with industries that by their very nature are almost accident-free. You probably know also that for over 20 years the railroads have not experienced a single explosive accident resulting in personal injury or property damage, which shows what can be done in handling around 8,000,000,000 pounds of potentially dangerous material. All this is accomplished by training and supervision and by following a strict routine.

Most storage facilities throughout the country conform to accepted standards, at least as to safety features. In most states they are prescribed by law, and accidents from this source are negligible.

However, I want to mention the relation of good storage to safe blasting underground. Explosives are designed to withstand a reasonable amount of abnormal humidity and temperature conditions such as could be expected at times between the time of manufacture and use in a blast. However, if these conditions are allowed to become excessive, they can and do cause hazards later. For example, wet ammonia dynamite will burn or fail completely. The gases from burning explosives are deadly in a confined space and such a condition might have been partly responsible for the four fatalities from fumes between 1940 and 1944. Misfires from deteriorated explosives are another potential hazard easily avoided, and the same condition can result from fuse which has been kept in a damp magazine. Wet fuse from poor underground storage is all too common.

Many management men and miners are extremely cooperative, but we sometimes encounter surprising resistance to suggestions for safer blasting. Such cases are difficult to fathom when we know these recommendations are practical, are in widespread use elsewhere and have been known to prevent accidents. I have found some miners who harbor a feeling of injured pride if they are found to be following unsafe practices, whereas actually they may be living on borrowed time.

Peculiarly enough, some of the rules for handling explosives can be violated for years and years with a clean bill of health until the critical condition is met and we have a "blow." And nobody can understand it because apparently things were no different than usual. I am reminded of one experience. An old-time miner was crimping caps on fuse with his teeth. A green explosives salesman was visiting the job that day and told him he'd better use a cap crimper. "Aw, I've bit millions of 'em, son, bit millions of 'em," but the very next day his jaw was blown off in the act.

Recently I was on a large tunnel job where they were using 440 volts for electric firing. I suggested to the superintendent that he install a safety switch between the blasting switch and the face and also put in a 5-foot lightning gap on the power side of the switch. As most of you know, such a layout is generally accepted as good practice over the country and will definitely pay off in the end, but his answer to me was that he had shot that way for 35 years without any trouble and therefore saw no reason to change.

But the conditions I have described can be materially improved by picking the men more carefully for handling explosives and then giving them proper training. Obviously, the careless man or one who is too stubborn or proud to adopt safer practices has no place on an explosives job.

Some accidents are less frequently caused from an actual lack of information. Many companies have instituted regular courses of training for blasters and I believe the idea could well be adopted generally in some form or other. I am sure the explosives manufacturers would cooperate to the fullest extent. As an example of misinformation, I might cite the case of the shaft sinking accident where eight men were killed and four injured because the boss thought the fuse burned one foot per minute. Most fuse burns 1½ feet per minute but some companies use a posted rate of two feet per minute for safety. Actually, a liberal education in the science of handling explosives could be obtained simply by reading the case inserts in the packages. In my travels I have found very few men who even see them, much less read and practice what they have to say.

Another one of the early steps toward elimination of blasting hazards is the selection of the proper explosives and accessories for the job. The function of an explosive is to detonate at the proper time and perform its job completely and suc-



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cessfully, and every suggestion we as powder men have to offer is directed toward this end.

For example, an explosive unsuited for wet work may fail or burn in a wet hole. As a result, we may have dynamite in the muck, a "hot" bootleg, or an excessive amount of poisonous gas. In addition to eliminating these hazards, the correct explosive will provide the best possible breakage in the primary shot and thus tend to minimize secondary work on the grizzly as well as chute blasting, both of which are fairly dangerous jobs. Did you ever stop to think that often the powder with the lowest initial cost may prove to be the most expensive in the end?

Likewise, the proper type of fuse is essential for successful blasting in wet work. Perhaps even the best fuse is not good enough, and electric firing is necessary. Here again, judgment and care must be exercised, and the advice of the powder company may be needed for best results. It is a well-known fact that some types of delays are better suited than others to solve the problem of water hammer in wet shafts. The proper selection of a blasting machine or the correct voltage for power firing equipment are equally important if we are to avoid misfires with their attendant hazards.

A new type of short interval delay has been developed during the past three years. A whole series of them are available, all firing before the first period regular delay, which shoots in approximately 8/10 of a second. These new fast delays are furnished by different manufacturers in intervals ranging from 25/1000 of a second to 50/1000 of a second. Their chief advantage from an underground safety standpoint is elimination of powder in the muck and also elimination of powder in bootlegs. They are replacing regular delays for both stope shooting and heading work and can be used for obtaining rotation firing of adjacent holes as well as parallel rows of holes. Concussion is also generally reduced over regular delays as well as damage to timber.

The first operation underground is drilling the blast holes, and here we immediately encounter one of the most prolific sources of blasting accidents in mines. Although all known company and state regulations specifically require careful examination of the face for "hot" bootlegs before drilling, accidents still occur from this cause. The most effective means of prevention, of course, lies in the elimination of misfires at the source with all the necessary precautionary measures which this entails. But assuming that some failures will occur, vigilance in scaling and, in most cases, washing down the face is the best protection for the driller. Yet in spite of all precautions taken to date, he will still occasionally drill into unexploded powder. In some instances the bootlegs containing explosives were thought to have been squeezed shut by pressure from the other holes and thus escaped detection when the face was being examined. In our opinion, however, such an occurrence is very rare.

In one recent accident in Michigan, the previous shift knew that powder was left in a bootleg but did nothing about it. Apparently everyone on the next shift also knew of the condition except the young miner doing the drilling and as a result he lost his sight when the powder was detonated by the drill bit. This accident was certainly man-made and was due not only to one but to a succession of careless practices. In the last analysis, it is up to the man directly involved to look after his own safety regardless of the neglect and carelessness of others. Obviously, he should never drill in a bootleg or even close to it.

Blast holes should not only be properly drilled so they will break the burden, but they should be blown out with air before loading. Failure to do so greatly increases the hazard of loading from the standpoint of friction. You may already realize that a dangerous condition exists when a mixture of explosive and grit is tamped too roughly even with a wooden pole.

Another source of trouble is the forcing of a primer through too small an opening such as a hole not properly cleaned and if the insulation on the cap wire is abraded during loading, an added hazard is created from possible stray currents. Furthermore, with grit in the hole, the fuse or cap wire is much more apt to be cut in loading thus causing a potential misfire. A separation in the explosives column can easily result from such a condition.

The function of the ideal primer is to provide the safest and most dependable means of firing the charge. Although numerous so-called short-cuts to good primer making have been devised, to the best of our knowledge there is only one procedure which attains this objective. The cap should lie along the long axis of the cartridge and be securely held in place. Any deviation from this practice is apt to result either directly or indirectly in an accident, possibly due either to separation of cap and explosive by foreign material or jamming the cap between the cartridge and the side of the bore hole.

The methods generally recommended for many years when using fuse are well publicized. As you know, they usually involve punching a hole for the cap in the side or end of the stick and tying the fuse with string. The side method is ideal from a performance standpoint, but in our experience we have found it generally impractical as it will not be followed except under closest supervision.

The end punching is sometimes used but is likewise troublesome and in our opinion has the added objection of kinking the fuse when the next cartridge is loaded. Actually, lacing the fuse in the proper manner constitutes a satisfactory primer for general fuse blasting. It can be made up with a minimum of kinking and with less trouble than most other types, although we are not implying that laced primers should replace other approved types which are well established by many years of successful performance.

I would estimate that a large majority of fuse primers of the country are now being made in this manner and with entire satisfaction. With the modern types of fuse properly stored and handled and then used in conjunction with modern explosives, the dangers of ignitions from side spit or the chance of failures from this type of easy bend shown by the sample are practically nil.

If at all feasible, caps should certainly be crimped on the fuse at a central house, preferably with a waterproof type crimp. Such equipment should be kept in good order, and the operation should be located in a room allocated exclusively to the purpose. Stocks of caps in this room and exposure of personnel should be held to a minimum and the crimper should be mechanically operated. Two serious accidents in recent months resulted from a violation of these rules.



We have also had a change of attitude with respect to electric cap primers. We must admit that some of the methods recommended for years have proved to be cumbersome and impractical as well as unnecessary. Actual experience has shown that the half-hitch method of securing the cap to the primer cartridge is both simplest and most efficient.

Primer cartridges should be punched to take the cap, and this done only with a proper tool. The importance of this feature can not be over-emphasized as a means of insuring against accidents during loading and later from misfires. Too often even today caps are inserted simply by pushing them into the dynamite either with or without rolling the cartridge. Not many years ago, one company allowed its blasters to make up primers by laying the cap in a slit which was made in the usual manner in preparation for tamping in the bore hole. At least one accident I know of resulted as the primer was being pushed in when the cap slipped out and wedged against the collar or side of the hole. Likewise, rolling the cartridge for inserting the cap in the end gives little or no protection and is definitely hazardous.

The device which I have here is one of the most efficient and safe means of punching primer cartridges that I know of. It has an interchangeable bottom and can be either held in the hand with the round end or mounted on a bench or powder box with the flat plate. The length can be made to suit the length of the cap shell. With this punch, we are assured of obtaining a hole of ample diameter and depth with a minimum of effort.

Primers, should, of course, be made up at the last possible moment before being inserted in the hole which means at the face. This punch recommended for such purpose is not manufactured but a working drawing is available. The length of the model will make a hole deep enough for a 10th period delay. When shorter caps are used, the punch length may be decreased accordingly. In some cases, such as high speed tunneling and shaft sinking, it may not be feasible to make primers at the face.

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Here a well constructed primer house supplemented with suitable transportation may actually be less hazardous even though the caps and dynamite are in contact for a longer period of time. Generally, however, use of this mounted center punch either at the face or at a sectional primer house located nearby will be much safer.

The operation of loading bore holes is always a potential hazard and the location of the primer has a very important bearing on performance of the blast. There are two principal requirements which must be met by correct placement of the primer; first, it should not be pulled out or cut off by adjacent holes firing previously and it must detonate the entire charge to the bottom of the hole. These conditions are generally met with both fuse cap and electric cap primers by placing them in the bottom of the hole. With cap and fuse it is necessary to bend the fuse around the cartridge so the cap points outward.

This method offers some potential hazards where the primer makes a tight fit and where cold fuse is loaded in the presence of water. However, some mining companies make this method mandatory, and, if conditions are satisfactory, it does meet the requirements. Under many conditions a safer recommendation generally is to load two or three sticks first and then place the primer with the cap pointed toward the back. This method is satisfactory unless the holes are short or the ground very seamy or rubbly.

With instantaneous electric caps, it is best to load the primer cartridge next to the last in the hole with the cap pointing in. If the column is excessively long and ammonia dynamite is used, the primer should be loaded in the center of the charge. For delay shooting, the primer should be loaded first with the cap pointing out. A so-called cushion stick ahead of the primer is not necessary for safety if the primer is properly made and may often be left unexploded in the bootleg thus causing a definite hazard.

Generally speaking, the explosive should be tamped although this is not necessary from a safety standpoint if the column is held in place by stemming. Otherwise, of course, the compression or jar from prior firing holes may force the cartridges out.

Slitting of cartridges with a knife can be done safely but perforated or pre-slit shells eliminate this operation. Tamping poles should certainly be of wood. Some types of pressed fibre or plastic have been suggested but many of these materials are too hard and are therefore as dangerous as metal from a friction standpoint. It is true that copper-tipped iron bars have been used for years but they are definitely hazardous and have caused accidents. The wooden pole may be tipped with rubber to decrease wear but in any case should be kept square and should not be allowed to broom or fray on the end and thus collect a mixture of explosives and grit. At least one explosion was attributed to such a condition. Needless to say, care should always be observed in tamping explosives. A mixture of grit and dynamite will not stand nearly as much rough treatment as dynamite alone.

It is very important for the primer to make a reasonable fit in the hole. If too much clearance is allowed the primer cartridge may collapse completely under pressure with disastrous results. Where unusually severe conditions exist, some mines use paper tubes for reinforcing the primer cartridge, which in our opinion, provides the ultimate in protection beside facilitating primer make-up at the face. With a tube, half-hitching of the leg wires becomes unnecessary.

Although the addition of a paper tube does increase the carbon monoxide content of the gases from the shot, the actual amount added is very slight and of no consequence where ventilation is normal.

The use of electric primers in the presence of stray currents constitutes a definite hazard. However, this condition is greatly minimized with proper installation, including grounding and bonding, of power lines, tracks and pipe lines. When loading the primer, it is very important first to keep the bare ends of the leg wires shunted, to keep them from contacting the ground, rails or pipe lines and to be especially careful not to abrade the insulation with the loading pole. A shielded shunt which fully covers the board leg wire ends and insulates them from contact with possible current sources is a very valuable safety feature obtainable from some manufacturers. One operator working a very conductive ore body has introduced a 1 to 1 transformer in the power firing circuit to further reduce danger from stray currents.



The need for stemming is a very controversial issue among miners. Although Bureau of Mines tests show that stemming increases the efficiency of the charge, actually this is very hard to prove on most underground blasting jobs except where the holes and charges are relatively short, say three to five feet. Nor does the use of stemming reduce fumes from the blast if general performance otherwise is normal.

When firing blasts primed with cap and fuse, it is very important, first, to see that all fuses are spit, and second, to see that this is done well within a safe time limit. The problem of lighting fuse safely under adverse conditions presents a definite hazard and as shown by statistics has been responsible for a substantial portion of underground blasting accidents. In this respect in particular, it is generally conceded that electric firing is safer. Haphazard methods should never be used in lighting and at least two men should be present during the operation. Hot wire lighters are preferred but lead spitters are also satisfactory. Both are more dependable than carbide lights which may not be properly prepared and may go out during the lighting operation.

In one case on record, two miners were lighting an 18 hole round with carbide lamps. During the process they had to recut several fuses to get them spit and at the 17th hole both lamps which had been set down, tipped over and went out. They finally got No. 18 lit but were caught when they got about 100 feet away—one fatality. It seems unnecessary to mention that fuse should be trimmed to obtain firing intervals but in actual practice this is sometimes done by a waiting period between the spitting of holes, also a very dangerous practice.

The bunch method of lighting with which you are all probably familiar, is used successfully by some operations, although there is always the possibility that one isolated fuse may not be spit. Admittedly it does have some safety advantages but has never been adopted generally, possibly due to the extra cost of long fuses.

The practice of double fusing wet lifter holes is used in some mines and prohibited in others for safety reasons. Although with the types of explosives and fuse now in use, the possibility of an ignition appears exceedingly remote, it is our feeling that where conditions are severe enough to require double fusing, electric firing should be introduced.

Electric firing practices differ widely and since the use of power current for this purpose appears to be on the increase throughout the country, this type of firing can be particularly hazardous in conductive ore bodies, and I certainly feel we should take a little time for a discussion of proper procedures and equipment. As with any other type of blasting, the main objectives are to fire the blast completely and dependably, thus preventing misfires and to do this with the minimum hazard to personnel from stray currents or any other source whatever.

We first need an installation embodying certain fundamental requirements followed by a rigidly controlled routine. The power assembly should generally contain three units consisting first of a power entrance switch, second, a special blasting switch separated from the power switch with a 5-foot gap and flexible jumper, and third, one or more auxiliary safety or sectionalizing switches depending on the layout. The gap is for protection against lightning and leakage from the power lines.

The blasting switch should be equipped to short circuit the firing lines in the "off" position and should be made so it returns automatically to the shorted position when the blaster lets go of the handle. You can see that if the lightning gap is placed on the mine side of the switch it would not be feasible to provide automatic shorting of the firing lines which we feel to be essential. Canada requires that this be accomplished by gravity but in this country a spring arrangement for the purpose is working very satisfactorily. You probably all know of cases of prematures where the blaster forgot to pull the firing switch from the previous shot before the next one was hooked in.

The firing switch should be mounted in a cabinet which can not be closed except when the switch handle is in the "off" position and the jumper cable disconnected. A pilot light in the cabinet should indicate when power is at the switch and another

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light or audible signal should show when current is flowing in the firing lines. It is important that all switches except the entrance switch not be grounded as an added protection against prematures which might occur from a leaky switch in the same hook-up with some grounded cap leg wires. I know that many of you have your own layouts which embody these same principles and are probably doing the job safely.

The firing lines should be single copper conductors of ample capacity, well insulated and should be mounted well in the clear of other power wires, pipe lines, etc. As you can see, these precautions are all essential to prevent firing current from escaping and stray currents from entering the circuit. The additional safety switches should be provided with a shorting bar in the "off" position as an added precaution. Most of you are familiar with such an installation and are fully conversant with its safety features, and yet it is surprising how many operators today try to get by with makeshift arrangements of all sorts. I sometimes feel it's a wonder we don't have more explosives mishaps than we do.

Statistics show that a substantial percentage of accidents are due to prematures of one sort or another and it is known that a fair number of these are caused by stray currents. Fully equal in importance to a good blasting installation is bonding and cross bonding of rails and service lines, a factor too often neglected. In one instance on record, the drillers received an electric shock when touching the face with one hand and the track mounted jumbo with the other. Although an observed potential of 24 volts existed at this point before bonding, it disappeared entirely afterward. Even with good bonding all power supply both AC and DC should be cut off the section before loading a drift heading. Another point that should not be overlooked is, of course, the blocking up or insulating all bare joints between leg wires. Also before hooking the temporary leads from the blast to the permanent firing lines, the latter should be checked for strays by suitable means. A squib is sometimes used for this purpose, but a small rugged instrument now being developed should prove much more satisfactory. I have brought a sample of such an instrument with me and would like to have your comments on it later. I think you will agree this is better than touching the ends together or to your tongue as I have seen some blasters do. Here again, it is up to the individual to check conditions before exposing himself to possible hazards.

This discussion would not be complete without a few words of warning regarding some of the other underground hazards. Flying material in particular is responsible for a substantial number of accidents, and is probably the most difficult to combat of any in underground work. This is caused mainly by two bad practices, staying too long at the face and carelessness in guarding the blast location and the only remedy we can suggest is greater vigilance and better organization.

Lightning, while not such a frequent offender, is still to be reckoned with. Although the lightning gap described above will keep the static charge from entering the blasting system, it can still follow the pipe lines and rails into the mine with disastrous results if proper precautions are not observed. The first safeguard should be the proper grounding of all surface power equipment as well as service lines and pipes entering the mine. Certainly no loading of holes should be conducted near the shaft during a lightning storm and while it may not be practical to follow this procedure throughout a large operation, all wiring, pipe lines and rails should be removed within at least 50 feet of the face before loading.

As you may know, there have been a number of fatalities in recent years due to premature underground blasts from lightning. In one case on record, a lightning charge followed the bell line into a shaft while a shot was being loaded. Eight men were killed and four injured. In two other mines that I know of personally, several men were killed by prematures from lightning while loading shots several thousand feet from the shaft bottom. All these accidents could have been prevented by the precautions I have described.

Another hazard always with us in mines is fumes. The manufacturers have made tremendous strides in recent years in reducing the poisonous components in the gases from blasts. Class I explosives are now available in all the various types of explosives needed in mines. But it is, of course, still necessary to take precautions underground. Adequate ventilation is a must and the miners should be strictly prohibited from going back into a place too soon after a blast. In one case on record a man returned after one hour following a shot of around 200 pounds of gelatin under poor ventilation. The normal procedure was to wait 16 hours until the shift came on again. As can be imagined, the miner was asphyxiated, probably in a few minutes since his blood was found to contain 60 per cent carbon monoxide saturation.

One more source of accidents should be mentioned. This is a somewhat unusual type and may often be overlooked until it is too late. It involves firing a charge close to another charge which in turn burns instead of detonates. I recall one small mine where the miner was firing a number of holes singly in rotation with regular electric caps. The holes had all been loaded and were only about three feet apart. After shooting one hole, he went back up to connect the next one. Hearing a loud hissing sound, he ran out just in time to miss getting caught when the next hole shot. The charge had been set on fire by the first hole flash through a crevice in the formation. A similar situation exists when attempting to fire a failed charge by loading a fresh primer outside of to much stemming. It is always a good rule never to go back on a blast too soon, particularly where unusual conditions are known to exist.

Secondary shooting is usually either on the grizzly or up in the finger raises and chutes. The chief hazard in connection with the former is the use of short fuses and lack of care in making up capped fuses. The minimum fuse length for any work of this type should be 24 inches for a single shot, yet we know of many instances where 10 to 12 inch lengths are usual. In one instance a capped fuse 10 inches long was found in a miner's pocket after he had been caught by a mudcap shot. Better still, use electrical firing with a blasting machine for maximum safety. Similar reasoning applies to chute blasting where it is absolutely essential that ample time be allowed for placing the charge or bomb. This can be provided only by electrical firing.



## Accident Prevention Concerned with Blasting

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In this article an attempt is made to point out the safety factors contributing to accident prevention in the blasting methods used in the Holden mine. In the order of movement of powder and detonators thru the mine, the accident prevention program can be outlined in terms of: delivery of powder and caps, powder storage, detonator storage, mining methods, technique of loading holes, methods of wiring shots, procedure in primary or long-hole blasting, and, finally, safety measures in secondary blasting techniques. In terms of man-exposure involved in the functioning of the operations pertaining to the transportation of powder and the technique of loading and blasting, the maxium number of men directly exposed is limited to two or three.

1. *Delivery of Powder*—A requisition for a 24-hour supply of powder is filled from the main magazine. The magazine is located outside the mine at a safe distance from the portal and other outside buildings, conforming with the specifications recommended by the U. S. Bureau of Mines and

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the State of Washington Metal Mining Safety Standards. The powder is nipped underground by motor. The train is made up of powder car or cars, with a "dead" car interposed between the powder car and the trolley locomotive.

The powder car has a flat bed constructed of wood and held to the chassis by bolts countersunk in the wood. The powder cases fit snugly inside a wooden rack that is adjustable to varying loads. This rack prevents the possibility of the cases jarring loose should the train derail. The delivery crew is made up of motorman and a nipper.

The delivery of the powder underground coincides with the time when there is no traffic in the main haulage level. (The ore and waste trains operate during the swing and graveyard shift.) The powder train with its 24-hour supply moves to the No. 2 Shaft at approximately noon. At No. 2 Shaft, the car is 'spotted' at the station. The underground working crews are at lunch, and the cage is free of traffic. The powder is delivered to the various levels. In accordance with company rules, no one is allowed to ride the cage loaded with powder except the cager.

A nipping crew picks up the car or cars at the various levels. The haulage of explosives on the lower levels follows the same pattern as on the main haulage level. The train is made up of motor, 'dead' car, and powder car. The powder moves to the underground magazine. The trolley wire in these haulage drifts is located no less than 6½ feet above the rail. All rails are bonded and grounded.

2. *Type of Underground Storage*—The underground powder magazines are located at the extreme ends of the haulage drifts where no further development work is planned. The rooms are approximately 20 feet by 10 feet by 7 feet high and are offset from the haulage drift by about 20 feet. The entrance to the magazine opens to a short cross-cut drift. The floor is lagged with two-inch lagging. The ventilation is good and the rooms are dry. A heavy wooden door with substantial hinges seals the room from the drift. The magazine is kept locked with a special lock and the key is accessible to authorized personnel only. Good housekeeping in and around the magazines is strictly maintained.

3. *Detonator Storage* — The detonators are stored in the 'cap' house located in an abandoned drift on the 1500 level. A series of wooden shelves built in the room keep the detonators dry and well-ventilated and in order. A constant temperature is maintained in this room.

The powder man, who has access to this 'cap' house, fills his requisition for the number and type of 'delays' needed for the day. He then transports the 'delays' to the 1400 level make-up room.

The 1400 level is an abandoned level, of which one section houses a powder magazine used exclusively for development-heading powder. Another section of the 1400 level houses the make-up room where the powder man makes up the delay primers for the headings. Thus the requisitions for development powder converge on the 1400 level. Delivery of powder and primers is made by the powder man's helper, who, following safety regulations, transports the powder and primers in non-sparking containers. The time of delivery follows as closely as practicable to the time of loading out the round.

### Mining Methods at Holden

Any discussion on accident prevention in the Holden mine, particularly pertaining to blasting procedures, can be much more easily understood if a brief outline of the Holden method of mining is depicted. There are inherent in the mining method a number of factors that contribute a high degree of safety to the men working underground.

First: Both the ore zone and country rock are characterized by hard, stable ground. There is little necessity for timbering in the drifts except in a few localized sections.

Second: There are no large open areas mined out in the development work. The unpredictable hazard of falling rock becomes subject to better control and the morale of the miner is improved as the knowledge of the comparative safety in small drifts, cross-cuts, and raises.

In the development of a block of ore for production, the following data is taken into consideration in laying out the proposed development; the ore zone inclines between



65 and 70 degrees; the width varies between 30 and 80 feet; and the general average length of a single stope is between 200 and 300 feet. Based on these data, a haulage drift is driven parallel to the ore zone and located some distance into the country rock from the foot-wall side. While this is in progress, diamond drill stations are cut on the foot-wall side of the drift 50 feet apart, and diamond drillers, following behind the drift miners, punch holes into the foot-wall on the horizontal and at a plus 45 degrees. The economical limits of the hanging and foot-wall are delineated in the ore sample analysis. In the meantime, a service drift about midway up the ore block is being driven under similar specifications, namely, on the foot-wall side and in the country rock. Diamond drill holes are drilled here, too, and a check of the foot and hanging-wall is obtained.

At the base of the proposed stope a service raise is initiated from the haulage level and is located midway in the stope's lateral dimensions and projected upward approximately 60 feet where a cross-cut is driven to the foot-wall. Now a slusher drift is driven parallel to the ore body and in the foot-wall side of the ore zone to the full length of the stope. Draw holes are punched thru the slusher drifts and a series of funnels are mined out.

In the meantime, a series of drifts are being developed along the foot-wall and hanging-wall of the ore body at approximately 75-foot vertical intervals. These are called blast-hole drifts and are seven feet by seven feet in section. The hanging and foot-wall blast-hole drifts are joined by cross-cuts at designated intervals, depending upon the mining procedure for the stope. The function of the cross-cut is to act as a slot. Raises, run in the hanging-wall side of these slot cross-cuts, act as a starting point in which to blast the slot.

The picture of the stope development at this time is a block of ore sectioned into 75-foot slices by a series of blast-hole drifts around the perimeter of the ore body. These sections in turn are sliced vertically by a series of cross-cut slots. Below these sections a series of funnels open to a slusher drift. A pair of slushers set back-to-back midway in the drift slush the ore from the draw holes to grizzlies which open to a common pocket. The ore is drawn out of this pocket to the haulage train below.

The ore block is now ready for drilling. Diamond drillers equipped with air-driven diamond drills move into these blast-hole drifts. They are equipped with specification sheets detailing where to set up the machine. Diamond drill holes are drilled at right angles to the drifts and into the ore body. The intervals between rings vary from 5 to 8 feet, and the holes are fanned out in vertical planes. These holes average from 35 to 100 feet in length and the drilling angle and depth are carefully calculated for the amount of burden.

The cross-cuts thru the center of the block are drilled vertically and the holes extend from one cross-cut to the cross-cut below. In the blasting procedure these vertical holes are blasted to the hanging-wall. The resultant picture is a slot or slots extending thru the ore body from the hanging wall to the foot-wall. The ore body when completely drilled out is a series of perforated planes at right angles to the hanging-wall and foot-wall.

### Technique of Loading

The sequence of blasting of the various levels begins at the slot and moves ring by ring toward the outer limits of the ore body. The advantage of this method is that the blasting of the rings can be controlled thru the various levels so that a constant arch is maintained in the ore body. The stresses that develop in the gradually enlarging stope can be carefully controlled, resulting in a minimum slabbing off of low-grade rock in the hanging-wall and tending to offset a possible rock burst in the adjacent service drifts along the foot-wall.

*At no time during the entire stoping operation are men working in the open stope. The diamond drillers are continually retreating from the slot and the loading of the long holes for blasting is done in the protection of the drift.*

During the loading of these blast-holes a minimum number of men are exposed to a premature blast. Where operations are on schedule, the diamond drillers have finished their work and are out of the area. The drifts are cleaned of extraneous pipe. The rails were removed before the diamond drillers moved into the drifts. Any

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material that could act as a conductor of stray currents has been removed.

The leader and his helper are assigned loading sheets which indicate location and length of holes, the number of 'delays' and the type of powder to be used. Armed with these data, the leader and helper proceed to the ring; the powder is nipped to the drift and loading begins.

Tamping a 50 or 100-foot hole at right angle to a seven-foot by seven-foot drift at a flat angle would present a problem. However, using wooden tamping sticks consisting of six-foot sections joined by an ingenious positive-action catch, tamping becomes a simple procedure. These sticks are six-foot lengths of round, straight-grained fir equipped with a locking device made of non-sparking material mounted at each end.

This stick was developed by Mr. R. L. Soderberg, diamond drill foreman, and has proved an efficient and safe tamping device. After the primer is placed in the hole and the hole is loaded out, the primer is tested with a galvanometer and the holes are wired together in series.

The series of holes are then shorted together and are ready for the wiring hook-up.

### Wiring Hook-Up

Preparatory to blasting operations in the stope, a permanent wiring system is installed. Along each blast hole drift, 14-gauge rubber-insulated twisted wire is mounted on Forest Service Porcelain Tree Insulators that are pinned to wooden plugs in the "back" of the drift. These wires lead to the base of the service raise, terminating there in a pair of wire clips covered with rubber fingers. From the base of the service raise to the top of the raise a similar set of twisted wires is installed.

From the raise station to the service drift, thence to the panel board, is another duplication of the same set-up. The panel board is mounted at the 283 Winze station, which is roughly about midway along the entire ore body. These lead wires from the stope terminate here in a pair of rubber-covered clips and are labeled for location. On the panel board is mounted a Trumbull Switch, double-pole, single-throw type. The switch is grounded to the rails in the haulage drift. The current is 440 AC. The switch is locked in ground position and the key is in the hands of the shifter in charge of blasting.

During a typical blasting sequence, the following precautions are taken to assure the safety of all men involved in the work.

After the loader has received his instructions on which ring to load, he completes his loading operation and ties his primer lead wires to the insulated wire in the drift. This is done only when he knows that the ring will be fired on that day. As he retreats toward the haulage drift, he ties in the clips at the base and top of the service raise. The shifter in charge of blasting will, as he moves through the drift to the panel, tie in the clips at the service raise station to the haulage line and finally to the panel.

The blasting is done on the swing shift. This swing shift is broken up into two time intervals: 3:30 P.M. and 6:30 P.M. At 3:30 P.M. the swing shift enters the mine. It is comprised of slushermen, hoist men, cager, haulage crews, and maintenance men.

The shifter in charge of blasting has a list of the headings and blast-hole rings that are scheduled to be blasted that evening. He informs the entire crew on what levels and where the blasting will take place. (The underground crews in the immediate area of the blasting are shunted to a safe location where they will wait until the "all clear" signal is given.) The cager and maintenance men will remain at No. 2 Shaft which is a safe distance from any development or production work.

The shifter in charge of blasting now checks with the outside lamp room by phone. A check on all lamps "out" is made. A welder or repairman may be working overtime on the 1775 level. The lamp check indicates that he is still underground. Before blasting operations begin that man is found and warned to a safe position.

After the blasting foreman is assured of the location of all men underground, he proceeds thru the sequence of firing at all levels. He checks the circuits with a galvanometer at the service raises, ties in the clips to the panel board, fires the shot, and locks the switch to ground position. This routing is followed at all levels. He then informs the men when blasting operations are over. This operation requires about one hour and a half. At 6:30 P.M. a crew of miners move underground to the various development headings and proceed with their work.



### Loading Holes in Drifts and Raises

There are two precautions taken in loading holes in drifts and raises that have resulted in fewer misfires. These procedures are standard practice at Holden.

1. In making up a primer with a "delay," the delay is laced thru the stick of powder, about midway in the stick and at approximately a right angle. The delay is then inserted in the end of the stick far enough to produce a cushion of powder behind it. The result is a smooth leg wire with no chance of kinking and shorting out against the side of the hole.

2. In loading the hole the primer is inserted first, with the delay end against the bottom of the hole. The powder is pushed in firmly with the loading stick—not tamped with jabbing blows. The reason for the position of the primer in the bottom of the hole is that when the ground breaks during the blasting interval there is always a possibility that some of the rock will shear off a delayed hole and drag the primer with it if the hole is loaded with the primer in any position other than at the bottom of the hole. With the primer in the bottom of the hole the possibility of misfires has been reduced.

### Secondary Blasting

The precautions observed in secondary blasting are of pertinent value to this article and deserve a paragraph or two of space.

In the operation of the slusher drifts, the company has observed that plugged draw holes and oversize boulders on the grizzlies can be broken by capping the rock with a small amount of dynamite and blasting with a lighted fuse. The hazards involved here are less than drilling the rock and using an electric detonator. While it may be argued that electric detonators guarantee an unlimited time to get out of the slusher drift after placing the powder, the presence of 50-horsepower electric slusher cables, electric light circuits, and welding outlets would more than offset the advantage of time by the increased opportunity for stray currents to produce premature blasts. It has therefore been the policy to use lighted fuse with the following precautions being observed:

1. Two men must work together in the slusher drifts.
2. The minimum length of fuse is three feet. (The burning rate is 40 seconds per foot.)
3. No more than three shots may be fired at one time.
4. In case of a missed shot, the slusherman is not to return to that area for a period of 2 hours.

The preference of capping a boulder rather than drilling a plug is based on the precaution that in long hole blasting there is a possibility for a slab to break loose with part of the long hole intact and filled with powder. In plugging, the drill may come in contact with the powder. Perhaps a greater efficiency in blasting may be achieved in plugging a boulder as far as powder consumption is concerned, still the removal of the potential hazard is believed to compensate for this.

Another precaution is the use of an air whistle to warn those in the haulage drift below that blasting is in process. A warning of this type is sufficient to prevent anyone in the haulage drift from climbing the service raise leading to the slusher drift where the concussion might knock them off the ladderway.

In addition to this, a safety chamber is cut in this service raise about 10 feet below the slusher drift floor and just off the ladderway where the slushermen may retire until after the blasting.

The ventilation of the slusher drifts is accomplished effectively by leading into the haulage drift fresh air from a forced ventilation system. The fresh air courses up the service raise to the slusher drifts. Here it divides and passes by the slusher operators down the slusher drift past the draw holes, progressing to the far ends of the slusher drifts. A ventilation raise at each end of the slusher drift carries the smoke and gas up to a "wind" drift and from there to a system of ventilation raises that eventually lead to a fan exhaust system.

It is only a matter of a few minutes after blasting that the smoke and gas has cleared out. The slusher men are able to work in clear fresh air regardless of the depth of the level.

# Causes of Vitiated Air in Metal Mines

By F. F. NETZEBAND
Consulting Engineer

Vitiated air, or in mining vernacular, "bad air" has long been a serious problem and an unpredictable hazard in most mining districts of this country. "Vitiated" as defined in Webster's dictionary means: "impaired or lacking in quality." The mining industry's particular concern with the quality of this air is its lack of oxygen. If sufficient amounts of vitiated air is able to pollute the underground workings, its effect is to reduce the oxygen content of the mine air to below that which will support life.

Official reports of the U. S. Bureau of Mines indicate that vitiated air may be deficient in oxygen, have excessive amounts of carbon dioxide or both. A very limited number of these tests were made in the Park City mining district of Utah by the writer and showed this type of air to contain very little oxygen and that the increase in carbon dioxide was negligible, that is, in comparison to the decrease in the oxygen content.

Regardless of the ratio of these two gases to each other, the trend is to the hazardous side, that is, the oxygen decreased markedly while the carbon dioxide content increased. Neither trend is desirable from a safety standpoint. Experience has shown that men have been overcome or made seriously ill on exposure to this condition. Fall of person accidents may in some cases be attributable to this exposure.

This type of hazard may be divided into two types: rock or strata gas and oxygen deficient air due to man made operations. Strata gas although very limited in occurrence, does pose a special and often serious problem in certain mining districts. Apparently this problem is limited to western states whereas "bad air" may be encountered wherever underground conditions are favorable for its development. By this I mean depletion of the oxygen content of the mine air due to mining operations such as dead end drifts, timbered stopes or oxygen-free water.

Strata gas is a natural phenomena and poses a distinct intermittent hazard when mine openings tap its outlet. Experience has shown that this hazard occurred more in the past than at present. Several factors influence this change in frequency such as young mines expanding with new drifts and stopes open up so-called "feeders" along faults, vugs and fissures which permits the strata gas to enter the underground air, the tendency of this condition to remain in old abandoned stopes and drifts and the depletion of some of these "feeders." Experienced men and management eventually had some of these sources spotted and on changing weather conditions would not allow workers in the immediate area.

Entrance of strata gas into mine openings is a natural sequence to a falling barometer, and its degree of entrance is largely dependent upon the amount of drop and its duration. These gas emanations generally occur prior to and during a storm period. There is considerable doubt and no substantiating evidence that these emanations continue on a rising barometer. It does appear logical, however, that this condition would continue from an extreme low barometer to some higher point where the atmospheric pressure equalized or exceeded that of the gas. Daily check of the barometer where these gases are present is the most practical means of anticipating such conditions, and management operating mines in these areas use this simple method of control.

These gases are found in both active and inactive mines, in producing underground areas and in abandoned stopes and drifts. Control measures are usually instigated where the gas problem affects the operations in active mines. However, no such effort is generally made once an area or a mine is abandoned.

In some cases the source or feeders of this strata gas remain a potential hazard for long periods of time whereas in other instances the dissemination of the gas into underground workings is of limited duration. Utmost caution must be exercised by workers on reentrance into abandoned mines or areas where the gas has been known to be present. A potential hazard is always present under these conditions since once the gas is emitted into underground workings its effect of depleting the oxygen in the air persists until normal air can be introduced to supplement the oxygen content.

The exact cause and sources of strata gas still remains a much debated question. Effort has been made in the case of the Park City and Tintic district mines to tie the cause into the geology, that is, through the contacts of the various types of rock which might account for its source through chemical action and to the fracturing of the rock due to earth movements which permits the gas to enter the mine.

Any attempt to assess the causes of vitiated air would naturally seem to lean to a chemical theory, whether it be the strata gas emanating from the rock or the "bad air" often found in dead-end drifts or old abandoned stopes. Analyzing the first type, strata gases, it appears that these originate in the igneous rocks or at the contacts of the igneous with the sedimentary rocks, where through earth movements or oscillations, resulting faults and fractures permits the gas to permeate large areas of porous brecciated rock.

A common theory is that they are the gaseous products of magmas or the metamorphism of sedimentary rocks by the intrusion of the igneous ones. Where the internal pressure of this gas is greater than the normal atmospheric pressure, the gas tends to enter underground workings at all times. Under more common conditions, this strata gas enters only on a drop in barometric pressure. Such a drop in pressure always proceeds and is indicative of an approaching storm period.

The second type of vitiated air, "bad or oxygen deficient" air, may be caused by:

1. Oxidation in heavy sulphide ore zones.
2. Absorption of oxygen by the rock.
3. Depletion of oxygen by timbered stopes or drifts.
4. Depletion of oxygen by oxygen-deficient ground water.
5. Any combination of the above conditions.

All but the first cause usually develops only in dead-end drifts, abandoned stopes or where underground ventilation is inadequate.

The first condition, oxidation of sulphide minerals is limited to those of copper or iron mostly, but there is recorded evidence of lead sulphide oxidizing to the carbonate under favorable conditions. This oxidation problem is not limited to robbing the air of its oxygen, but the process also gives off considerable heat as well. In some instances there is enough heat involved to increase the rock and mine air temperatures to uncomfortably high levels. Ground waters are also adversely affected in that they become acid and carry considerable copper salts in solution. Thus a couple more problems are raised, excessive heat and dermatitis due to the acid condition and the dissolved metal salts in the water.

Unquestionably some types of rock absorb oxygen from the air when exposed in mine workings. This condition is noticeable only where the ventilation is extremely poor as in dead-end drifts or in abandoned or sealed-off areas.

It is definitely known that timbered ground will absorb oxygen from the air and is evident in the ultimate decay of the timber with the resultant deficiency of oxygen. Surprising as it may seem, water on underground timbers tends to arrest decay rather than foster it, so that air rather than water is the cause of decay.

The occurrence of oxygen-deficient ground water is a debatable question. However, indications point toward its existence since the rapid oxidation of some sulphide ores is limited to certain mines and to certain areas in the mine, tending to imply that some waters are lacking in oxygen. A slow drip of water in isolated drifts or stopes can deplete the oxygen content which tends to indicate that the falling water picks up the oxygen.

Any combination of the above factors usually enhances the development of vitiated air in underground workings.

In conclusion, it is apparent from the above discussion that vitiated air presents a definite health hazard in mining operations. Though limited in scope by the conditions necessary for its development, its predominant occurrence in old workings or in abandoned mines makes it an extremely dangerous hazard to the careless or the uninformed worker. Adequate ventilation and barricading or sealing off dangerous areas help to control it. Coordination of safety measures with workers cooperating will eliminate accidents from this source.



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# Training Practices of the Montreal Mining Company

By H. J. GEMUENDEN
Training Director, Montreal Mining Co., Montreal, Wis.

Oldtimers have always been looked to for breaking in and teaching new men the various jobs peculiar to mining. The burden of learning, however, has been heavier upon the new man than was the responsibility for teaching upon the oldtimer. Young miners were expected to "catch on" from working and associating with experienced partners. Much reliance was placed upon their ability to observe and assimilate upon their own initiative.

The progress of learners was checked and watched critically, but the quality and content of the oldtimer's instruction was merely assumed. Verbal instruction consisted largely of such statements as, "Bring the machine," "Turn on the air," "Get the oil can," and "Go for powder." Explanations were meager and unplanned, and gave *little heed to the* learner's fears, interests, and learning ability; nor to the *fine points of the job.* Questions were answered if asked but for the most part a new *man* was expected to understand the reason for the act just from *seeing the* deed, and little attention was paid to what or how well he could see the job *being performed.* Learning was a challenge. New men just had to prove they could "take it" and that they could "fit in." If they got hurt, or if they bungled a job it was their fault because they didn't have the knack for learning or doing the job.

Today, in the Montreal Mine, the emphasis is being transferred from learning to teaching. It is assumed that any men company examiners approve as physically and mentally fit for mining can do the work safely and efficiently if they are taught correctly. It is also assumed that directing the interests of experienced workers to their responsibilities for complete and correct instruction will improve their own attitude toward correct performance of job details.

It is prerequisite to this training philosophy that supervisors, captains, foremen, and experienced workers with whom the new man comes in contact fully appreciate their responsibilities for training and that they be equipped to carry on training on a planned basis. They should know the principles of effective instruction and be *skilled* in their execution. They should know exactly what the new man is expected to know and do on each job, and they should have a plan or schedule for training him in each requirement. They must have an attitude that makes the new man feel that he is not just being permitted or challenged to learn, but that he is being taught, and that what is being taught is of utmost importance *to* him and to the company. Accordingly, the first step toward securing better and more complete instruction is to prepare supervisors and experienced workers to be better teachers.

Foremen and their respective experienced workers are *assembled* in groups of 8 to 15 by job classifications for surface and underground conferences on the subject, "How to break in a new man." It is important that a foreman or supervisor who is directly responsible for follow-up training be present at each meeting since he represents authority on all questions of procedure, policy, or practice; and his active interest sparks the discussion. Without his endorsement and wholehearted acceptance the program is ineffective. All experienced workers in every job classification are included in these preparatory training sessions, though it is not expected that all of them will become effective instructors. It is felt that the development of appreciation for and interest in correct practices justifies the inclusion of all experienced employees in the program. Men who show outstanding abilities as instructors are given extra follow-up *coaching,* and new men are routed through them for training.

Job classifications covered include stationmen, slushermen, motormen and miners. Meetings are conducted by job classifications since objectives are not only to develop teaching techniques but to organize instructional material. During the first session attention is given only to "How to teach," but during succeeding sessions, which are held in actual working places, attention centers largely upon "What to teach." Since all men in the group are engaged in the same type of work there is common interest in job procedures.



The first meeting for each group is of two hours duration and is held in a surface conference room in the last afternoon of a week in which the participants are working on the night shift. The meeting time is set to end just prior to the beginning of the regular night work shift. Men are paid overtime for attendance.

Succeeding meetings, usually three in number, are conducted in actual working places underground during the next week when members of the group are scheduled to work on the day shift. For underground sessions the group is subdivided into from two to four groups with consideration for the relative location of their working places. Underground meetings for all classifications are held on company time during the regular work *shift* at such times that do not interfere with contract production. About an *hour* is required for each of these underground meetings.

In the first session a training specialist presents the well known 4-step method of correct job instruction, demonstrating its adaptability to mining jobs, and impressing the group with its *responsibility for* training inexperienced men. In succeeding meetings *individual members* of the group are given an opportunity to apply the 4-step plan of instruction to some part of their job under actual working conditions, while the others observe critically both the method and the content of the presentation.

*From the ensuing discussion,* which is always spontaneous, a complete breakdown of *the job is established.* The trainer is *merely* a referee in these job discussions, directing and limiting them to the job in question. Ostensibly he is concerned only with correct job instruction, but the foreman and the men are interested in proper procedure, so comments are prone to center around what and how things should be done on a particular part of the job. Full agreement on the steps and keypoints essential to each job is secured and set up as a pattern for instructing new men. Later, printed copies of all job breakdowns are distributed among the participants for subsequent use as a training guide.

Besides focusing the attention of experienced workmen upon their training obligations, these training sessions clarify and organize for them essential job details, some *of which heretofore* lacked uniformity. For instance, motormen, in their instruction demonstrations of "How to lubricate the *locomotive,*" instructed their respective practice learners to use all the way *from a pint* to two gallons of oil daily. Discussion established one quart as the proper amount for complete and adequate daily lubrication.

*In every job hidden* keypoints were uncovered and set up as instruction points *to be emphasized. This* was true in even such simple jobs as breaking chunks with an air-hammer. Invariably, oldtimers neglected to point out the use of their knee and leg in lifting the machine onto the chunk. Consequently, back strain was common among new men on the station.

Possibly the biggest value derived from this preparatory training for better job training is the improvement in the attitude of the oldtimers toward their own jobs. Critical observance of other oldtimers, discussion of job details, and organization of performance patterns tends to put their job in the light of a craft which they now realize is worthy of pride and respect. Written job-analyses are taken home for the whole family to peruse. The job is no longer a task which they must perform to live—it becomes a combination of skills, know-how, information, judgment, and craft secrets which over the years they have learned and mastered. They recall *that during their own learning period* instruction was insufficient, and they resolve *to see* that new *men they* train get the whole story, with all the keypoints.

Going on apace with the preparation of oldtimers to be good instructors is the conditioning of, new men to feel responsible for learning and to be receptive to training. This is accomplished through an eight-hour, escorted tour of the mine in which the new *man* is given a preview of the entire mining job. He is met at the change house by a trainer at the beginning of his first shift, and the whole day is devoted to orienting him and impressing him with the planned procedures, the mechanization, the consideration for his safety and comfort, the specialized craftsmanship, and the personal satisfaction which make up and surround work in an underground iron ore mine.

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He is assured competent and considerate training in every job to which he may be assigned, but he is charged with responsibility for conscientious learning in his expected advance from breaking chunks on the station to breaking ore in a stope. His curiosity and apprehensions about mining are satisfied and he is convinced that there is something to mining worthy of his best efforts to learn. He is shown that there are planned, correct methods for doing every job and that even details are the result of study, so he reports for work the next day ready and willing to be taught and to learn just what and how things should be done so they will be safe, right and to his credit.

The new man begins work on a station, so his job training begins there. The station boss, who is a leadman on the station crew, assumes full responsibility for instructing him in all of the fifteen tasks and seven *informational subjects* into which the station job is broken down. While instructing, the station boss works right with the new man, telling and showing him exactly what to do, patiently, completely, and repeatedly, until he knows the man knows. He uses the prescribed 4-step plan of instruction in which he has been previously trained, and he reviews prepared job-breakdowns to make sure training for each new man is uniform and complete.

Among the tasks and informational subjects covered in organized station training are such items as running dirt through the grizzly, pulling chunks, breaking chunks with a sledge and with a chunk breaker, cleaning cars, dumping cars with a trip bar and with an air lift, taking samples, tallying, layout of the station, purpose of the grizzly, the hoisting system, grades of ore, and specific safety rules. The new man is kept reminded that every thing taught him on the station is by way of preparation for his work as a miner.

Three weeks is allotted for station training. At the end of this time, the shaft foreman, who is responsible for all station work, checks the instruction with a formal check sheet. Of course he has watched and talked with the new man often ever since his first day on the job, so he knows his ability and progress, but this formal check draws the training to a head, makes the whole station crew training conscious, reviews correct procedures and underlying reasons, and conditions the new man for further training in his next job classification. The new man stays on the station until an opening occurs in a higher classification.

After he has been approved as trained for station work, but while he is still a stationman, the new man is further trained, first as a motorman, then as a slusherman. This is accomplished by taking him off the station for two hours every day for a week and placing him with an experienced operator in each of these jobs. Training here proceeds as described for station work. Experienced operators do the actual job training, following prepared job breakdowns, while supervisors do the follow-up and checking. As an example: a regular motorman trains new men in the motorman's job, two hours a day for a week, and the electrician in charge of the territory checks his progress and makes sure that all fundamentals are covered properly. Likewise, mechanics check the instruction of slushermen.

Under this plan, after five weeks a new man is basically equipped to enter any mining place for further training as a production miner. His mining partner will be an experienced man who has been trained to train, and shift bosses will spark and check his progress.

Preparing supervisors and experienced workers to be effective instructors, and training new men in proper job procedures are only initial steps in complete job training. The induction, orientation, and breaking-in procedures just described represent a conventional approach to training, but we must not expect too much from this type of training because it is only an approach. It starts a man right, but keeping him right and mindful of the things he already knows when he is on his own in a production stope calls for training of a higher order. Our big training job is with the seasoned workers, and it is best done on the job by line supervisors in their every day contacts with the men.

Supervisors generally recognize their responsibilities *for production, for safety*, for maintenance, for equipment, supplies, and services. They readily acknowledge that in discharging their responsibilities they must rely upon and work through other people, and that in doing so they employ three primary supervisory functions, namely: planning, directing and checking. They need to be reminded, however, that results will be improved when training through leadership is added to and made an active part of their planning, their directing and their checking. Jobs should be planned with the men who are to do them with due consideration to conditioning the men as well as the job. Directions or orders should be given with a thought to *inspiring* interest in correct procedures, and checking should be accompanied with an aim to developing an attitude of mutual pride in good, safe workmanship. Merely recognizing the need to do a job and telling a man to do it may get the job done, but incorporating some selling, some teaching, and a display of genuine personal interest in the details of the job by the supervisor himself not only gets the job done but makes a better workman, builds morale and shapes attitudes.

This type of training cannot be detached nor segregated from management and supervision. It must be an integral and active part of everyday supervision, so closely interwoven with regular supervisory functions that its own identity as a function is lost. Because of its obscurity it is easily overlooked or neglected by many supervisors. Accordingly it becomes a prime responsibility of top management to develop and promote its use. Interest, like authority, flows from the top-down. This is elementary, but it bears repetition. Interests manifested by top management become the interests of those next in line and work downward until they reach the worker.

There are many ways of making management interest felt. One common method is the report. Top management asks supervisors to submit formal reports on given situations. The request signifies management's interest and compels the supervisor to make a personal study of a situation, which he does conscientiously. Inasmuch as the report influences and directs the interests of supervisors and workmen it is a training medium, but a weak one, because it is a mechanical device designed to take the place of personal contact by upper management. The interests of top management cannot be implemented, delegated or passed on in package form. They can be effectively manifested only through dynamic personal directing, coaching, counselling and conscientious example by management itself.



We know the executive, or middle level of our managerial staff is burdened with many responsibilities and that there is little time for training as a sideline, but we also know that in their daily contacts with front line supervisors and workers executives have ample opportunity to inject an element of training, not as something extra but as a part of the job at hand. This may involve as little as a nod of approval, or as much as a complete analysis, but it must be a manifestation of personal recognition and interest.

To illustrate the application of this principle, suppose the safety engineer, whom we look upon as a staff man rather than a line executive, reports that on a recent trip through the mine he noticed several evidences of poor housekeeping such as dirty ladder roads, improperly stored tools, rubbish and food scraps in rest areas, etc. Top management here can nod and assume that executives and supervisors in charge of the respective territories will take care of the matter, or it can make a mental note to this effect, "Here is a chance to do some training." Then in personal conference with the executives in charge, top management makes its own convictions relative to housekeeping felt. This need not be in the form of reprimand or remonstrance but it must be positive, sincere, and direct, and so expressed that the executives, whom we call captains, are inspired with a new determination to secure clean and orderly work places.

The convictions of top management are now the convictions of the next level of management, and it becomes the duty and desire of this middle level to carry the same enthusiastic interest in housekeeping down to the foremen and workers. Because of management's interest, the matter of housekeeping will be pinned away in the captain's mind in a sensitive spot and as he makes the rounds with foremen he will be quick and ready to avail himself of every opportunity to sell and enforce good housekeeping. Whenever he encounters situations similar to those mentioned by the safety engineer, he directs an immediate cleanup, taking time to explain or show in some way that he regards orderliness and cleanliness

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as important indications of good workmanship and safety. His attitude toward housekeeping is catching, and after just a few displays of it his foremen catch on and become just as finicky and fussy about orderly housekeeping as he is.

The matter of housekeeping is selected as a random illustration. Any of a host of operating and safety details could be singled out and subjected to training procedures in like manner. Once a captain has made his foremen housekeeping minded he can turn his attention to some other detail like dust control, timbering, mucking procedures, etc. Tackling such things one at a time through a display of intense personal interest in their correctness is bound to condition the work habits and attitudes of the workmen.

This principle is so elementary and so fundamental to good management and supervision that it is embarrassing to express it. Nevertheless, it needs to be dragged out and gone over periodically because it has been too common and too close to us to be fully appreciated. It is one of those things that is frequently taken for granted, but all of us are prone to become so engrossed in the physical and mechanical aspects of our jobs that we need to be reminded occasionally that as supervisors we are expected to function as leaders of men rather than as directors of things.

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# Job Training for Safety

By L. F. BISHOP
Production Foreman, Anaconda Copper Mining Co., Butte, Mont.

The two main safety factors of any job are environment and conduct. If we can improve these factors together we can obtain safer mining.

Environment improvements are naturally thought of first. Good layout, ventilation, lighting, timber, guard rails, and protective clothing are tangible evidence of accident prevention measures. These are necessary and important and they do have a good influence on conduct. But we cannot institute these measures and then sit back and say "There, we are doing all we can for safety." Examination of accident reports all indicate too many accidents due, not to neglect of environment, but to carelessness, or neglect of conduct. Therefore conduct improvement is just as important as environment improvement.

Improvement in conduct is not as easy, not as tangible, and often not as permanent as improvement of environment. What a man does today may be done differently by him tomorrow under the same conditions and environment unless he acquires certain job habits which, despite something unusual on the job or on his mind, will cause him to continue to do things the safe way. The best means of cultivating the desirable safe habits is by continual job training.

In order to obtain the best results with job training the same principles which apply to the individual must be applied to the group in general.

First, we must have a plan. Who is to be trained? How many? Who is to do it? How is the best way to do it? The obvious answers to the first three questions are: "All the workers, both new and old," must be trained *by the supervisors*. The answer to the fourth question will depend on conditions. The Anaconda way is to organize student miner training groups for the new men and follow through with the same principles to the older men in the regularly operating places.

The next fundamental is to have the working places properly arranged as the workers will be required to keep them, equipped with the proper tools and supplies. This refers back to environment and means standardization as much as possible.

In the *presentation*, or the actual training, an essential requirement is "Get them interested." Personal experiences, posters, pictures, financial gains, and competitive suggestions are effective means of doing this. A lot depends on the approach. Which appeals to you most between these two?



"Fellows, here's a stope where the ground is heavy and the grade is poor. It is doubtful if it will pay off, but we have to give it a chance. Now it's up to you. Hop to it and work safely or you won't be here very long."

or

"Fellows, here's a place that takes a little careful handling. The ground is heavy and the grade of ore is on the line between profit and loss; any slough waste will make waste out of the whole works. This place can be made to pay off good if we keep it in good shape and work it systematically. Now this is the plan—" etc.

In the *performance*, or having them do the work, carry out all operations in a safe workmanlike manner. Insist on good housekeeping and discipline, and in return be interested in everything done and generous with credit for everything done well. Criticise faults in a manner suited to the individual. Bring in the safety angles as the work is outlined and make them a part of it, not afterthoughts. Keep pushing to develop good work habits.

Next, comes the *follow-up*. On repetitive routine jobs ask the men what they figure on doing. If it is as desired credit them with having know-how. If not, straighten them out with reasonable explanations. Check up on work done during supervisors' absence. Was it done safely? If not, why not? Check the personalities of the crews, especially the ones that do slipshod and indifferent work. It might be a poor combination which could be improved by some tactful switching. Continue to build a winning team out of the material available, a team that will get maximum production without accidents.

In order to get all these things done well, much is expected of the supervisor. He must get this and that done, some things started and some things finished, all safely. He must be diplomatic to have good job relations and yet have discipline. He is the management to the worker and he is the key man in getting results. Any help or tools he can be given to help him accomplish all the objectives will be returned many fold. Therefore, training the supervisor is a key point in training men. He should be sold on safety 100 per cent. He should be given an insight into costs, plans, and objectives. He should know thoroughly the company's wage payment system and the principles of handling people and maintaining good relations. Thus, knowing more of management will help him to be a better representative of them.

When all these training activities are carried out the improvement in conduct, as well as environment, should result in a lower accident rate.

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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

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In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

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## Management's Part in the Safety of Tomorrow

By R. H. HARGROVE
President, Texas Eastern Transmission Corporation, Shreveport, La.

Presented by E. E. EDMONDSON, JR.
Safety Director, Texas Eastern Transmission Corporation, Shreveport, La.

The biggest step in getting management to accept the burden of sponsoring safety is to make the people who are the management realize what their responsibilities are in this respect. I believe that we have in the past not had a full realization of those responsibilities, which are of a two-fold nature, and I further believe that our industry will not have a satisfactory safety record until both aspects of that responsibility have been accepted.

What are those "two aspects of responsibility?" One aspect has long been recognized—that which is due our stockholders and owners to operate our business as economically as possible, and to that end to reduce the lost time accidents, total disability and death accidents. Probably it is that responsibility which has brought most of us here today, at some cost of time and money.

There is another area of responsibility, however, which management should feel in relation to safety programs, and it is a responsibility which is to me more acute than the economic responsibility to stockholders. This second responsibility relates to our moral obligation to our employees to see that they have every opportunity to work in a safe environment. Under this responsibility we must assure ourselves that no company policy is one which might lead to violation of safety principles, and further, that we have inaugurated every feasible policy to enforce the observance and respect of those principles.

To be sure, our industry—the oil and gas industry—is one which is by its nature extra-hazardous and is therefore more susceptible to fatalities and serious accidents than are many others. There will inevitably be acts of God and unforseeable accidents which no amount of precaution or safety emphasis could have prevented. In such cases there can be sympathy but no feeling of responsibility. So, for example, on a drilling rig, if a cable should prove defective and part under pressure, resulting in a serious accident, we could feel no blame or moral responsibility for that. Or take for example an accident which might apply to any industry: a car shoots out from behind a truck to try to pass it—and runs head on into a car full of company employees. Certainly no blame can be assessed to management for that.

But suppose, instead of being hit by another car, the company car can't make a curve, turns over, and kills one or more of the group because this job called for a trip that required too much driving in too short a time. There I think management should feel a moral responsibility for having in effect a policy which called for that much overtime driving.

Management, then, has the responsibility of providing for the safty of its employees —a responsibility which looks both to the owner and to the employee. And the first step in discharging that responsibility is to accept it, to realize that you have it. The next step is to lay down the specific rules to follow to set up and carry out a worthwhile program. And that is liable to prove the hard part of the job.

If I could just hand out a mimeographed list of things you should do and things you shouldn't do, you would have an easy task. You could merely take the list back to your company, give it to your safety engineer or your assistant, and tell him to follow it. Then you would have no more responsibility in the matter. Unfortunately, I can't give you a list like that. Its a job you've got to do or have done in your own companies, by your safety departments, to fit your individual circumstances. The best I can hope to do is to point out principles to follow.

*The first principle is to be interested in safety yourself.* No safety movement is going to accomplish much of anything unless the top management shows a real and continuing interest in it. But if you show

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a concern for safety and keep your finger on the progress of safety principles, you'll send that interest right on down the line, and you'll accomplish the biggest part of the job right there, by making everyone in the company "safety conscious." The greatest danger of all is an indifference to safety.

Instilling "safety-consciousness" can go further than just to your employees, too. When you contract out a construction job, or a drilling job, you can pass that interest in safety on to your contractors. You may have a particular interest where the contractors' men are working side by side with your own employees, because one of the most disturbing facts about accidents is that they often leave the safety violater unharmed and maim or kill a bystander who might have been observing every safety rule. I have in mind particularly a case in point in our own company.

Construction workers were tying a 6 inch kicker line into our 24 inch line at our Station 5 at North Little Rock, Arkansas. Gas was being passed through the 24 inch line, but for this operation the section being tied in was bypassed and the 24 inch valve was blind plated so there could be no leakage. The valve on the 6 inch line, however, was not blind plated, but was merely closed.

As is always possible, there was a small leak in the valve, and enough gas leaked through into the section of 24 inch line so that when the welder struck his spark it exploded the mixture in the empty 24 inch line. One hundred feet away one of our engineers was walking through a four foot gap which has been cut in the 24 inch line when the explosion occurred. The force of it coming out of the pipe blew him against the open end of the other section of 24 inch pipe as though he had been shot from a gun. He considered himself lucky to come out of it with only a broken leg, but further complications developed, and the man is still walking on crutches today.

The accident, as usual, could have been prevented, if the workers had blind plated the 6 inch valve. But it couldn't have been prevented by the employee who was hurt; it could have been prevented by the close supervision of the construction from a safety viewpoint.

*The second principle for management to adhere to is consistency.* We, as policy makers and managers, must realize that we sometimes lay down a safety law that our employees may find it very difficult to follow because of some other policy of the company. For instance we might lay down a safety law that company cars ought not to be driven over 60 miles an hour, and then station our maintenance crews at such locations that long trips and long hours become routine. Under those circumstances you can expect almost with certainty that your speed limit will be exceeded.

We must bear in mind as a principle, therefore, that our company policies and routine must be such as to conduce the observance of safety principles and not to invite infraction. We must make available to our employees all the safety information, educational materials, and accident prevention equipment, that we can effectively use. And we must not as a matter of routine in their jobs, either because of a lack of time or an excessive amount of work or a lack of supervisory insistence, tempt our men to overlook our safety rules.

*A third principle is enforcement.* No safety program, no matter how well thought-out, how consistent, and how ambitiously presented to the employees, is going to be of any real value unless its provisions are enforced—by the management. Discipline is necessary in safety to instill an almost automatic respect for safety principles, so that compliance with those rules will be as natural as the acts themselves, so that in an emergency or any excitement those principles will be observed as completely as in normal times.

*Discipline in safety observance* is not an easily obtainable status. A driller's tin hat can get awfully hot under our Southwestern skies, and the temptation to work without it is something that has to be overcome by constant stressing of safety discipline. The same is true, to an even greater degree, of course, of speed limits on company vehicles, probably one of the hardest of all rules to enforce.

*How to enforce safety rules is a problem,* again, which must be met and solved in each industry and indeed in each company individually. There is no set standard of enforcement or any universally true rule in this regard, except that enforcement, to be effective, must originate and be sanctioned and approved by the top management. It is another phase of management's role in safety.

The lesson to be learned by management in safety advancement is one that has been taught, as I mentioned previously, over the course of many years, and in many places. But is it one which has been learned adequately and well? A look at the record of our industry can answer that question quickly.

In 1938 the petroleum industry reported 116 deaths or total permanent disabilities. Last year, in 1947, it reported 139. This was the highest figure for any year since 1938 with the exception of 1946, when 150 were reported. Accident frequency statistics of the same period show a similar record presenting a curve that begins at a factor of 12.7 in 1938, dips to a low point of 11.7 in 1942, rises precipitously to 14.9 in 1945, and for 1947 stands at 13.2.

These two statistical analyses of the past ten years' record would indicate to me that the industry has not learned its lesson well enough. To be sure, we have been more active and have employed more people during the past few years than ever before, but it nevertheless appears to me that we could, by emphasizing and popularizing a program of education and safety-minded job training, have materially reduced the accident rates. Indeed, we had a particularly propitious opportunity offered us by the increase in employees of the past few years. We could have attacked the problem with determination and foresight, and we could have had a record which we would have been proud to review today.



## Safety and Public Relations

By R. F. BAITY
General Manager, Sales, Standard Oil Company (Indiana), Chicago

Safety and public relations sound like two tremendous fields, as remote from one another as Shanghai from Kalamazoo. They are tremendous fields, but they're closely related—sometimes one and the same thing.

You may have a top-notch safety program in your company, and a fine safety record to back it up. But without an aggressive program to reach the people and sell them your program, you'll never get to first base with the public.

What is public relations? A friend of mine tells a story which illustrates it much better than any complicated definition.

Public relations, he says, is well illustrated by our pets. For instance, you have a horse; you feed him and take care of him, but in return he's ridden around. You feed a canary but he sings for his supper. Each pet gives something in return for his care.

All but the dog! You give him more attention than all the rest, even when he's just an old hound dog without a pedigree. Yet he does nothing but lie around and sleep all day. And when he dies, you almost die with him. Why? Because he's got a built-in relations department in his rear end. He wags his tail and wins your devotion. That's his way of showing affection. And it's mighty effective public relations.

We haven't done our job if we have a fine safety program and a good record, but still have such misconceptions among the public. And sometimes that public includes our own employees.

Safety is both *doing* and *knowing*. That sounds quite a bit like the first rule of public relations. Live right, and tell about it. Get a safety record to be proud of, and then tell the world about it.

Are we living right—safety-wise? You know better than I the things we're doing. But I want to point out that there are several kinds of safety. There is employee safety. That's one of our main concerns, and naturally, the main concern of our employees. There's safety designed to protect property and capital investment. And there's safety aimed at the consumer and the general public. Let's consider this last.

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### Do They Know?

Does the consumer, for instance, know that we are concerned about his safety—or does he think we're interested only in his cold cash? Maybe if he stopped to think, he'd realize that *safety is just good business.* We don't want to sell him just once. We want *him* to come back and buy again. He never will if our products and methods aren't safe. But too often people don't stop to think of such things—at least we can't afford to bank on such things being apparent *to the consumer.* Does he know? Have we told him?

Does he know—to mention only a few—that we have developed safe solvents for cleaning purposes; clean and safe domestic fuel oils; industrial oils free of substances that might be harmful to users, or might be the cause of accidents?

Does he know that research is constantly developing safer petroleum products? Does he realize the many precautions taken in the transportation and storage of products? For instance, a truck hauling aviation gasoline is not permitted to carry another product. Every fill-pipe and cap at the service station must be properly identified. Pumping equipment on trucks may be used for only one class of product. Customers' storage facilities are carefully identified. A system of contrasting colors and labels has been developed for flash recognition of packaged petroleum products. Does he know of even these purely mechanical details that are designed for *his* safety? Have we told *him?*

When you get right down to it, safety is just efficiency. If the product is compounded properly; if it is used correctly for the right purpose; and if the worker or user is himself efficient in his job—safety takes care of itself in 99 cases out of 100. The one-hundredth is the freak, the unforeseen and unforeseeable that exists everywhere about us in life.

Promoting good safety practices and training men to carry out our programs is the greatest challenge that men in your capacities have ever had to assume. Our safety records should be checked at regular intervals with the standards established under our training programs, always keeping in mind that there is one thing, and one thing only, that can bring about the improvement in our safety records that we desire, and that one thing is *people.*

Due to the disturbing state of affairs, internationally, nationally, economically, and politically, we find men and women in an abnormal and disturbed state of mind—people do not act or react as they would in more normal environment where we could enjoy freedom from fear. The difference between *carefulness* and *carelessness* is a state of mind—greatest efficiency is always obtained through the power of concentration. When there is a disturbing force which distracts the thoughts of people from their routine of responsibilities, then we may expect results that are below par, whether we are measuring production records or safety records.

As safety directors or promoters you do not find it difficult to develop good programs. Your problems usually arise from your inability to get your programs adopted and effectively followed by the various departments, and by the individuals that go to make up your organization. I make this statement on the promise that your experience parallels ours in trying to promote sales. I do not believe we have a man on our payroll in the sales department who does not want to be a good salesman, and when we find that a man's accomplishments are not measuring up to our expectancy we usually find that the man does not *know* how to do a better job. The solution to the problem is good training and sound encouragement.

Obviously, people want to live, work and play safely, but they, too, do not always possess *the know how,* and likewise must be properly trained and encouraged.

We should never progress to a point where we fail to possess a learner's attitude. I have found that no two people are exactly alike, but whether you are dealing with people individually or collectively they react pretty much the same under similar circumstances. If you want a friend, you must be one; if you want a job done, you must be willing to do a good job; if you want to promote safety, you must practice safety; if you want to develop interest, you must take an interest; if you want to convert a backslider, don't be one but learn to talk his language.

To make your program most effective you must use an oscillating approach—that is, you should turn to top management first and sell your program; then turn to your organization and put it into effect. See that supervisors down the line do the same thing—because a nod from the top is always more effective than a prod from the bottom.

But, even doing a good job on safety isn't enough. The public doesn't know what we're doing, and our job isn't done till they do.

We need to make friends *for* and *with* our safety record. And the beauty of it is that safety is a natural means of making friends.

*Of course,* safety is good business. But at the same time, isn't it the best way we have of expressing our concern for human relations? Then let's make safety work for public relations, and public relations promote safety! Let's wag that tail that will show our affection and concern!

There are many ways of attacking the job. When the oil industry set out to tell its story, the members of the information committee knew that there were many kinds of audiences, and that they would have to tell the story in a particular way through a particular medium for each — for the banker, the farmer, the professional man, or the industry employee.

### Emissaries of Safety

There are all sorts of media: publicity, pamphlets, speeches, ads, strip films, motion pictures, radio. But we must start at home. Our own employees are the best emissaries of safety and for making friends. My company realized this when it came to implementing the oil industry campaign. Employees met with trained leaders for a discussion about the company and the industry, and how to win friends for both. We recruited thousands of public relations representatives right there!

How much do your own employees know about your safety program and record? They are a public, too. Do they understand the occupational dangers honestly and clearly; and do they understand why certain safety measures are in practice? We've got to start at home—"to live right." We *can* sell our employees, *simply* by straight talk and confidence in them, and by *not assuming* that the safety story is obvious. We *must* sell them because not only are employees a public, but they're the best means of making friends we've got. In more than 90 per cent of the cases, an Opinion Research survey showed, public attitude was determined from personal contact with someone in the company or industry!

Our employees and our dealers, as they contact the public, give advice, demonstrate, and set the shining example for safe application and storage of our products. Daily these men are driving home carefully studied safety recommendations.

For a long time we deserved blame for many of the public's distorted notions about us. We didn't talk, didn't attempt to clear up misunderstandings. All that's changed now. Now our people are appearing before, and are being well received by, all kinds of organizations; schools, civic and service clubs, farm clubs, and business and industry associations.

How much of this sort of thing are we doing with safety? Here is one example. Ed Wiley, the head of our Whiting fire committee, tells of the time he addressed a group and told them of our fire organization at the refinery. After the meeting, one woman came up to him and thanked him profusely for the information. "You know," she said, "I've been living in Whiting a long time and I've always waited for the day when the refinery would blow us all sky-high. Now that I know what you're doing and how you're organized, I certainly feel differently about it."

### Promoting Public Safety

I want to mention another safety activity. This is the part our industry is playing in the promotion of public and traffic safety. Independent and major oil company representatives alike are taking part in local school and traffic safety campaigns and conferences. Many are active members of local safety councils. Here in the Midwest, we have many examples of this: In Milwaukee, for instance, where the largest safety school in the country is located, . . . in Duluth, LaCrosse, Kansas City, Grand Rapids, St. Joseph—and in other cities, large and small. In all of these you will find



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*local oil representatives taking an active* part, if they are not the leaders of the safety program.

Here again is something for you to sell. There's no direct cash return involved, just a sensible, good will activity from which the public benefits greatly.

In all of these activities we not only gain good will, which means better business, and establish a safer and saner world, but we are *assuring the safety of free enterprise* in our country.

Make no mistake about it: winds of change are blowing about the world. Government regulation, and even ownership of industries, large and small, is making its supreme bid today. The people are being bombarded from every side with arguments for this very kind of control.

What the future holds will be determined by *the thinking and the attitudes of the* American people. And that thinking is shaped by the influences to which it is subjected. If there are gross misconceptions about American industry, or an "opinion vacuum" in which distorted beliefs readily find root, the future will be shaped by these. *But*, if the true facts are known, the future of free enterprise is assured.

Where is the voice of business? Well, it's being heard, too. But business is still inclined to talk to people as buyers. It must learn to talk to them as well-informed, interested citizens. It must show them that business recognizes citizenship obligations of its own, is ready to fulfill them, and *is* fulfilling them. What better illustration of this than safety programs and safety con*cern*?

I'm not talking about hooplah over the "Great American System." I mean we must give facts, honestly and frankly, to the people. We have a record to talk about. We have the facts to give. We *know* that the American standard of living is still the *highest* in the world, and we *know* that only our present system of free enterprise will keep it there.

Public relations isn't something someone invented just a few years ago. It has always existed. You have it whether you want it or not. It isn't just a department or a function; *it's a state of things*, good or bad, that exists between any company and the public. It's just the business of making friends. We haven't always been conscious of it, it's true, or we haven't cared. Now we are beginning to spend time and money for this state of things we call public relations. We're setting up departments whose sole concern is to make friends with our public.

This business of making friends isn't an exact science like mathematics. The corner grocery store has one set of problems; Ford Motor Company has a much more complex set. Most of us in the petroleum industry have similar problems. But there are no exact rules for making friends. Still, there are certain fundamental things we've learned in the last few years. I'd like to *mention* just two.

### Rule No. 1

To begin with, the number one rule, or the Golden Rule of public relations, is *those who know you well, think well of you.*

There's an *if* hidden in that statement that may have already occurred to you. And that's "*if* your record can stand being known well." If you can't brag about your record, then those who know you best will think the *least* of you.

We might rephrase that first rule this way: First, live right—then tell about it! You may have all the virtues in the world, but if your neighbors don't know about them, you're liable to be suspected and accused of everything under the sun. How well we in petroleum know that!

The other rule is: When people have no definite opinion about a company or an industry, an "opinion vacuum" exists. This vacuum is usually filled by the first idea that comes along, plausible or not, and sometimes pretty erroneous. For lack of an opinion, people are ready to believe almost anything, and peculiarly enough, all too many people seem to prefer to believe propaganda flavored with scandal.

The public opinion survey made for the oil industry several years ago showed that the American public had some strange and startling and very disturbing misconceptions about our industry, even though only a minority held these ideas. As a result, we began, collectively and individually, to set



up an aggressive campaign to tell about ourselves. This effort is getting results, as shown by later surveys. We're proving every day that making friends is essential and profitable.

### Idea Association

Now how does all this tie into safety?

One of the devices used by psychoanalysts to discover an individual's pattern of thinking is "idea association." It goes something like this:

If the interviewer says *black*, chances are you would say *white*.

If he said *life*, you might say *death*.

*Good—Bad*

*Work—Play*

*Battle-axe—Mother-in-law*

All of us have these associations and many of them are peculiar to the individual, caused by some experience or influence in the past.

The American public, too, has certain strange and sometimes unreasonable associations in its collective mind.

For instance, say the words, *gasoline, oil, naphtha*—or *almost any* petroleum product —and, when it comes to safety, into a large segment of the public mind jumps the association: *danger, fire, explosion.*

Unfortunately, petroleum fires and accidents are often sensational. They make front-page news and consequently stick in the public mind. Because of this, these "idea associations" persist in peoples' minds.

I said at one point that there were the wrong associations in the mind of the public. What we are aiming at is replacing those false and malicious ideas with the correct ones. When the word "petroleum" is mentioned, we want the association in the mind of the American public to be, clearly and without hesitation—and with justification—"the keenest safety-minded industry in the world."

How are we going to accomplish this? First, by living right; that is, by doing everything we can to promote safety everywhere. Then—by talking, writing, telling our story and selling ourselves and our record through every conceivable means—by making friends with the American public!

Finally, to those who may feel that safety promotion is old stuff, I should like to tell an old, old story which you have probably heard—but one which, for obvious reasons, will never grow old:

*Two Million Americans Never Saw an Elephant*—That headline over a newspaper editorial tells the story of why the circus will come back next year. "Same old stuff," you say. Same old animals, same old stunts, same old ballyhoo. Maybe a few new thrills, but mainly the same old circus we saw when we were kids.

True, *but* every safety director or promoter should be compelled by law to see the circus every year, because of the great lesson taught therein. Sure, the same old elephant walks around, but between the time you saw the elephant this year and the time when you'll see him next year, more than two million new Americans will have arrived in this old world.

Every year over two million babies are born. Every year one million boys reach the girl-crazy age and start shaving the down off their chins for the benefit of a million young women who suddenly become acutely clothes-and-cosmetic concious. And every year, in spite of everything, two million young folks up and get married and start new homes and most of them drive cars.

Every day in every year new people become interested in automobiles and the petroleum products — fuels and lubricants which keep their cars running. Yesterday they weren't interested—today they are—tomorrow, other people will be. That's why we must constantly promote safety—safe *driving* and safe use of our products, and must keep talking safety day after day.

Our audience is not stationary, but is changing all the time. We are not talking or playing to a grandstand, but to a parade always on the move, continually bringing new eyes and ears into our audience. To some, *our safety story may be "old stuff,"* but to others what we have to say is as interesting as is an elephant to a kid who never saw one.

So the elephant walks around, serenely confident that among every bored group that says, "That's just an elephant," some eager voice will cry "*So that's* an elephant!"

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# Fire Protection in Bulk Plants and Service Stations

**(Panel Discussion)**

*Presiding:* W. O. Wilson, Manager of Safety, Standard Oil Co. (Ind.), Chicago.

*Discussion Leader:* C. E. Wells, Executive Secretary, Central Division, American Petroleum Industries Committee, Chicago.

*Participants:*

A. R. Bowles, Safety Engineer, The Texas Company, Chicago.

J. Howard Myers, Director of Safety & Fire Prevention Division, The Atlantic Refining Company, Philadelphia, Pa.

J. L. Risinger, Safety Supervisor, Socony-Vacuum Oil Co., Inc., New York City.

F. G. Wilson, Assistant Director, Department of Safety, American Petroleum Institute, Washington, D. C.

CHAIRMAN WILSON: The objective of this discussion is to arouse your interest in the serious problem that we now have in connection with legislation affecting our business. I refer to the rules and regulations that are adopted in many of our states by enforcement agencies—rules and regulations pertaining to the handling, storage and so forth of liquids. I am also thinking of the enabling acts that make the enforcement of the rules and the effects those rules have on our business, the interest of municipalities in that kind of regulation and the frequent effort of municipalities to regulate on their own where state regulation is not in effect or in some cases where it is in effect.

We have had a lot of trouble with regulation in the marketing end of the business—for example, the limiting of sizes of loads and so on. We have had a great deal of difficulty with legislation or rules and regulations on municipal ordinances concerning the use of highways, parking of vehicles, location of our bulk plants and construction of our bulk plants.

Mr. C. E. Wells, executive secretary of the Central Division of the American Petroleum Industries Committee, will be the moderator for this afternoon's discussion.

CHAIRMAN WELLS: My work with the American Petroleum Industries Committee brings me into contact with municipal and state legislative agencies when they contemplate legislation designed to restrict handling of and transportation of flammable products. Naturally, my work requires consultation with local departments of legislation where it is being considered.

It has been my experience that before regulatory or restrictive laws reach the legislative stage, there is frequently a common knowledge indicating something is in the wind. Rumor, therefore, can be an effective [illegible] of information which should be promptly forwarded to the parties concerned.

The consequent organization of API Committees is a means provided, as far as the oil industry is concerned, for the prompt and efficient reporting of legislative action on the part of municipalities. APIC organization contained a Local Affairs Committee and the chairman of the Local Affairs Committee, as part of his responsibility, should report promptly to the state APIC section any action of the city or county in regard to the rumor. The state office then notifies the national office of the APIC and the offices in the area where legislative action is necessary.

The national office checks files for material and data which may have been prepared on the same subject for use in the cities or states in other parts of the nation. This material is promptly forwarded to the divisional office. The divisional office follows a similar procedure and immediately prepares a preliminary study or statement and forwards it to the state executive secretary, who either places the material in the hands of his local affairs chairman or if the ordinances are of extreme severity he will take the material personally to the city involved.

In the end, that information can thus be made available as generally as the situation may demand, and the divisional office further advises the safety men of the companies doing business in the area. This notification has always resulted in the acquisition of still more data of value to the state PIC.



It is not at all infrequent that two or more of the managers of the safety departments of companies involved make themselves available for appearances before city councils for preparation of needed information regarding their companies' operation.

With this outline of the method employed in meeting legislation at the local level, a recent example might further clarify the explanation given and lead more directly to the heart of the subject of this panel. I am sure most of you recall the disastrous Minot, North Dakota, fire which involved not only the bulk plant but adjacent property as well and caused the loss of several lives. Flaming liquids ran into a nearby river and to nearby properties with the result that there were several lives lost. The reaction on the part of the public was, as could be expected, hysterical and they acted immediately, even before the state fire marshal concluded his investigation. The city council met for the purpose of drafting legislation to compel the removal of all bulk plants to points outside of the city limits.

This proposal was passed on the first reading and was to come up for the second and third readings for final passage about ten days thereafter. Time, therefore, became of the essence. Three of the oil companies, upon notice being given by the Chicago office, immediately made trained safety men available who went to the state secretaries to investigate for their own enlightenment the causes of the fire.

Careful examination and investigation revealed the cause of the fire was due to extremely hazardous practices which did not exist generally in the city. The practices were of such a nature that they could be corrected by a sane and reasonable fire ordinance.

To give you some idea of how a spectacular fire occurring in the city can become far reaching in its effects, similar bulk plant removal ordinances sprang up in South Dakota, Minnesota, part of Iowa, and even as far away as Kansas.

The city attorney's committee, following the prolonged meeting during which the investigator of the study of the model ordinance, adopted the F.P.A. model as their standard for recommendation to the cities in the state. Thus, any city contemplating any action in the Minot, North Dakota, fire was supplied with a copy of the model F.P.A. ordinance, and a similar procedure was followed in the state of Minnesota through the state fire marshals.

The city of Minot finally adopted a sane and intelligent ordinance which would correct the situation responsible for the fire and provide a better means of enforcement of existing ordinances. It would be highly inexact to fail to mention the value of the excellent cooperation of the National Safety Council in consulting with our people on many points involved in the Minot, North Dakota, fire. The sound and thoroughly objective counsel and advice of Mr. John Roche was invaluable. It should also be mentioned that following the safety engineers' investigation and the investigation of the safety fire marshal in North Dakota, all of the factors were presented to the National Fire Protection Association. The analysis made available for use in Minot, North Dakota, was extremely valuable. Thus, by using the Minot, North Dakota fire simply as an example, certain conclusions can be reached relative to the problems which are apt to arise in any locality.

*First*, when the local campaign is properly coordinated so as not to impose too heavy additional burdens the trained industrial safety man is about the best qualified individual to analyze a local hazard situation and make recommendations pertaining to it.

*Second*, except in larger cities, municipalities do not have the services of fire prevention departments with the result that the local fire department is very frequently compelled to take an arbitrary and unreasonable position simply as a matter of self-protection.

*Third*, the generally accepted misunderstanding that a stringent and unreasonable law will, of itself, correct and prevent fires is an ever present problem.

*Fourth*, there is the responsibility of the legislative body, whether city or state, which, as representatives of the people and responsible for the public safety frequently is inclined to take action designed to stop and close every possible avenue through which an accident might occur.

*Fifth*, newspapers, fire departments, council men and legislators are all in need of accurate and dispassionate information regarding the handling, storage, and use of flammable products.

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If the proposals very frequently considered, at least at the local level of government, are any indication, one must conclude that the general public has no real appreciation of the importance of petroleum products in the everyday life of the individual citizen and the modern farming or industrial community. Service terminals and transportation facilities are increasing because of the growing dependency of the public, industry, and farming upon petroleum products. These visible signs of growth carry with them a bad taste on the part of the municipality which result in the passage of new ordinances and have resulted in alarming discrepancy between municipalities in such matters as truck sizes, truck specifications, industrial storage, and so on.

This makes the transportation of flammable products dangerously inflexible. It prevents the shifting of automotive equipment between municipalities which can and has resulted in the need to build equipment designed to meet local specifications. Designs are so different that movement is localized. This situation suggests at least one solution—namely, the advocation of laws at the state level placing jurisdiction and the authority to make rules and regulations in the hands of the state fire marshal.

It may be a question of whether or not it is advisable to voluntarily seek out regulation. A thorough discussion of all of these problems is necessary and there can be no better time or place for such a discussion than through the medium of this section of the National Safety Council.

MR. FRANK G. WILSON: Mr. Wells poses two sides to a very important question. On the one side, there is the advocacy of laws at the state level, placing jurisdiction and authority to make and enforce rules and regulations in the hands of the state fire marshal. On the other side, he suggests that perhaps industry should oppose regulation in any form. My personal opinion is that state regulation is the logical approach to proper fire protection in bulk plants and service stations.

The petroleum industry recognizes that the insurance underwriters usually regard ordinances and laws in the light of recommended good practices and attempt to use the latter for legal regulation. It should therefore be clearly understood, at the outset, that what we would be willing to see written into state law is not necessarily what we would write into our own construction standards as an industry.

In discussing the question of regulating tank trucks with Mr. J. E. Moss, Director of the Division of Transportation of the American Petroleum Institute, he stated that there are actually two problems: "(1) practical engineering, and, (2) a requirement or regulation that it be followed, and if there is no regulation there will be poor compliance and local groups will make a variety of requirements." We are confronted with essentially the same two problems.

Mr. James E. Hill of the Union Oil Company has said, "Experience has shown that if we will not do this job ourselves, others will. Then the burden will be on us to get hundreds of cities to modify existing rules to meet our requirements. That is a rough job and much less satisfactory than our having our basic knowledge of good fire protection incorporated in the pattern used by all of the fire chiefs in the country in drafting their local regulations."

There is a growing tendency on the part of state fire marshals to recognize the ability of petroleum safety engineers. Recently the Ohio state fire marshal, confronted with the need for an up-to-date code, called in a group of petroleum safety engineers and gave them the assignment of drafting the new regulations. Using a draft of the proposed NFPA ordinance revision as a model, they evolved what can be considered an outstanding state fire code for petroleum.

Of primary importance to our discussion is the fact that state regulation, such as was adopted by Ohio, will tend to curb a multiplicity of divergent view in the municipalities as to what constitutes proper installation and protection. In commenting on the effect of public opinion following the Minot, North Dakota, fire, Mr. Wells has already told you that the city council, acting immediately, even before the state fire marshal had concluded his investigation, met in emergency session and drafted an ordinance designed to compel the removal of all bulk stations to points outside the city limits.

In California a great deal of time is spent in combatting certain of the proposed state laws which are impracticable, unnecessary, and would interfere with efficient operations with little, if any, increase in safety. There have been numerous instances in California where petroleum operators have had a scant thirty-six hours to prepare briefs for presentation at hearings before municipal authorities apparently bent on legislating against petroleum operations. In commenting further on the Minot, North Dakota, fire, Mr. Wells reported that careful examination and investigation revealed that the fire was the ultimate result of extremely poor and hazardous practices. That condition seems to maintain more often than not. How many of you ever heard of Tolleson, Arizona, before the Associated Press gave nation-wide publicity to a picture of a gasoline fire taken by a teacher of the local high school. The outstanding feature of that fire, as reported in the August *Petroleum Safety News Letter*, was the substandard construction of the plant which accounted for the magnitude of the fire and explosion.

Briefly, the facts are that a truck and trailer was discharging gasoline into one of two 7200-gallon, vertical, 16-gauge, corrugated iron, water type, storage tanks, when the tank was overflowed. The vapors from the spill ignited when the driver pulled one of several nearby open knife switches to shut down the flow. Here, then, are two instances which achieved national prominence, and in both cases the offending plants were guilty of substandard construction. That is why we need uniform, statewide regulation.

In the smaller cities the fire department may be inexperienced in the art of fighting oil fires and when a blaze does break out the firemen may be at a loss to know how to cope with it. But lack of experience and knowledge of petroleum characteristics is not confined to fire departments in the smaller cities. Let me cite as an example what happened not long ago in Washington, D. C.

The leading sentence of the newspaper story read: "Four firemen suffered second and third degree burns yesterday when caught in a flash fire while cleaning a boiler at No. 18 Engine Company. Fire Marshal R. C. Roberts said the four men were cleaning and rust-proofing a boiler in the basement of the fire house when the oil that they were using ignited in a flash of fire. It could have ignited from a smaller furnace about eight feet away used for heating water."

Subsequent investigations revealed that the oil they were using was actually a mixture of gasoline and oil. That, in addition to other examples of flagrant violation of safe practice, resulted in the suspension of the captain. Testifying in his own defense at a hearing, the captain stated that he believed the fire, which started in the engine house basement while the gas-oil mixture was being used, probably started in the chimney above the boiler. He further stated that he believed that gasoline vapors would normally siphon off through the chimney rather than come out into the room.

George Prussing, who most of you know and respect for his interest and ability in connection with this vital problem, in discussing the progress made by the Conference Committee revising the NFPA Suggested Ordinance on Flammable Liquids, had this to say: "We as an industry still have much to do to bring our concepts of fire and accident safety within the realm of scientific knowledge. The vast disagreement on basic facts is appalling, especially in the matter of fire protection among our safety engineers, even those in responsible places. There are still too many things on which these men differ. These disagreements get in the way of any concerted effort such as the writing of a national code for the regulation of the storage, transportation, and use of flammable liquids. Most of our thinking is still based on fear rather than knowledge."

Few persons, including city officials and even fire marshals and inspectors are aware of the degree of safety with which gasoline can be handled, primarily because some marketers in the industry allow the devastating effects of their negligence to establish a rule rather than an exception.

Fires are costly. Fortunately, for the petroleum industry, only one fire originates and spreads from an oil plant to six that originate outside and endanger oil property. But wherever they start, they cost the oil industry money. There is, of course, a tangible stock and equipment loss every time a bulk plant is attacked by fire, but there is also an intangible but very definite loss of reputation for safety, bringing with

it the possibility of an increase in the burdensome regulatory measures already imposed on the industry.

Obviously, the public and the municipal and state officials should be educated as to the true degree of danger, or lack of danger, which a bulk plant represents. This, then, supports Mr. Wells' conclusion that newspapers, fire departments, councilmen, and legislators are all in need of securing accurate and dispassionate information regarding the handling, storage, and use of flammable liquids.

There is a refinery in California, that I know of, which has one of the most complete fire training programs. Recently this refinery suffered a fire, which in the course of an hour, did damage to the extent of $138,000. The official report carried this statement concerning press relations: "Press photographers were conducted to a safe place from which acceptable pictures were taken. The local management gave reporters a clear story of the fire. As a result the press reports were surprisingly accurate and contained a minimum of dramatic embellishments."

The problem of educating the public is necessarily a gradual process, but in the end it will pay amazing dividends. I am sure you will agree that if there had been adequate regulations our industry would not have suffered the physical losses and embarrassment of unfavorable publicity occasioned by the episodes at Minot, North Dakota, and Tolleson, Arizona.

Where regulation is necessary, we want the best. We want uniform, statewide, practical, but not burdensome, regulation with compliance by everyone. It is only logical that we should have it at a level from which the greatest mutual benefits will accrue. My personal belief, and I emphasize the word "personal," is that that is the state level.

As for an educational program, a successful program will be the best of public relations. In my opinion there is no question of following the advisability to assist in drafting regulation. Either we accept regulations voluntarily with an opportunity to advise in the preparation, or we will have it crammed down our necks, regardless of its merits.

MR. A. R. BOWLES: The question which Mr. Wells has so capably stated, and which Mr. Wilson has so ably defended on what may be termed "the side of law and order," is certainly one which is of prime importance to the petroleum industry. This question is important because it is inevitable that action must soon be taken, either by the petroleum industry itself or outside forces, whereby the safety regulations of the industry can and will keep up with the rapid growth of the industry.

With all due respect to the opinions of the previous speaker, I would like to advance some arguments in favor of the petroleum industry keeping its own house in order and maintaining as our own prerogative the establishment of rules and regulations for the safe conduct of our business.

The first objection I have to either state or municipal legislation is the diversification of such legislation. The petroleum industry has in recent years made such rapid advances in marketing and distribution that no one city or state has been able to keep pace with proper legislation, let alone establish a coordinated program of rules and regulations so that the petroleum industry may efficiently operate.

The construction of water terminals, the advances made in truck transportation, the construction of "The Big Inch" pipe lines, and the addition of new handling equipment and methods are much too vast and have occurred too fast for equitable handling by state or municipal bodies.

What possible efficiency or safety can accrue from legislation which results in the limitation of storage capacities in one city but not in another; which governs the size and location of pipe lines in one area but not in another?

In some locations none of these things are given any consideration, and in others all of these and several hundred more are legislated either for or against, whichever is the most restrictive.

We have states which prohibit the use of a static chain or strap, while the state adjoining makes such a piece of equipment mandatory. We have municipalities where gasoline trucks are limited by legislation to 1200-gallon loads. It is obvious to you petroleum men interested in safety that this particular type of legislation results in hazard rather than safety. The gasoline trucks in this city must make three times as many trips as necessary, and with partial loads, which is an additional hazard. Certainly, such a condition is both inefficient and dangerous. When we invite legislation, however, that is the kind we will get.



Both Mr. Wells and Mr. Wilson touched on the fire at Minot, North Dakota. I was one of the men who investigated this disaster and consulted with those concerned. I can understand why there was hysteria with condemnation following such a disaster, which is an inevitable result of such an accident.

But, despite this fact, I cannot condone the drafting of an ordinance outlawing bulk plants because of it. I think it is quite evident to all of us who were involved in this incident that the legislation which resulted, while admittedly somewhat arbitrary and unreasonable, was taken simply as a matter of self protection by the individuals who were responsible for local legislation.

That was my own personal deduction from the discussions I had with men in the Minot area, and we talked with those men and in many cases they openly agreed with us that our stand was perfectly reasonable. We invited them to come down to some of our plants so we could show them how we handled flammable products safely.

Despite that fact, the answer of some of the local legislators at that point was, "I know, but to protect my own job I have got to do what the public asks me to do."

Due to a lack of a fire prevention department, except in large cities, self protection by individuals is too often used as justification for restrictive legislation. Certainly, an industry as productive and as essential as the petroleum industry is due more consideration than that. I don't recall ever hearing of a city passing a law outlawing hotels following a hotel fire.

Mr. Wilson has already stated that a little knowledge is a dangerous thing. This is but another reason why I believe the petroleum industry is more capable of maintaining its own standard of safety without legislation.

Without any intent to belittle either fire marshals, state inspectors, or legislators, but rather in sympathy with them because of the tremendous task they have to accomplish, I say that it is almost impossible for them to have an adequate understanding of static electricity, vapor-proof equipment, temperature, pressures, and flash points, electrolysis, characteristics of petroleum products, and the many other items necessary to properly regulate the safety of the petroleum industry. This is exactly why they have a growing tendency to recognize and depend on the ability of the petroleum safety engineer—a fact which Mr. Wilson has mentioned.

I go into plants in this whole central area of the United States, and many times an agent or representative of a local plant very proudly steps up the minute he sees me and says that the fire marshal was in the previous week, or the city fire inspector was in and he gave them a very fine complimentary letter or he said that the plant was okay. I know that you gentlemen run into the same thing. I know most of you have plants where the city fire marshal makes a superficial study of your problems and says, "Gee, this is excellent. I wish I could say the same about the one down the street."

I could go in that plant and in ten minutes I could tear it apart, because that plant is my business. I don't have to go to the place down the street. I don't have to know anything about their troubles.

Mr. Wells, in his opening remarks, stated that "his" work brings him into contact with state and municipal legislative agencies when those agencies contemplate legislation designed to further regulate and restrict the handling and transportation of flammable products.

Note particularly the word "restrict." You may recall that I have used it a couple of times myself. Mr. Wilson, in his fire discussion, said, "few persons, including city officials, fire marshals, and inspectors are aware of the degree of safety with which gasoline can be handled." I, for one, agree that it is true. Why should we seek restrictive legislation when we can take care of ourselves?

In closing, I want to say that it is my personal belief, that the petroleum industry is perfectly capable of setting its own safety standards.

If we don't keep our safety standards in step with our progress in our other fields of endeavor within the petroleum industry, the matter of safety will be taken out

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of our hands and restrictive legislation will most certainly be crammed down our throats.

MR. J. L. RISINGER: Before we go too far, I think we should say a word about present conditions. Today we have national agencies which provide model ordinances which can be taken up by local communities in formulating local ordinances.

The committee is now working on revising these ordinances which brings this question into importance. Although there is a model provided, there are various and sundry kinds of local ordinances in and throughout the country. No two of them are exactly alike. Some we might call impractical, and say they are going further than necessary. Some are not.

Then there is the problem where we have no regulation that covers the subject. If we start out to remedy this, we may have to go back and change it all the way from the top to the bottom.

In regard to the idea of whether regulations should be at state or municipal levels, there are several factors to be taken into consideration. If these regulations are at state level, they will be more effective and provide a standard of uniformity. They will also cover areas not now covered.

The local community can carry out the state regulations by forming their own ordinances in compliance with the principles of the state rules. Having them at the state level would, no doubt, cause consideration of practical ordinances in the level of the community. Of course, in state regulations it will be necessary to make these regulations more brief, more elastic and leave to the local ordinances the fitting in of the particular terrain and other conditions.

It is my opinion that neither type of regulations will cure all of the problems in the petroleum industry. Although they may help along these lines, there are certain other things that have to be done, and the oil industry must be the leader in them. If we want to get this thing on an even keel and keep it on an even keel, we must do several things. The necessary steps must be taken to bring into line through education and regulations those who are not following regulations and to broaden it to take care of all of the areas.

I think the oil industry itself would get the greatest amount of help out of practical elastic state regulations which they could get behind. They can make the regulations fit into the local situation.

MR. J. HOWARD MYERS: Recently a fire marshal took the most restrictive code that had ever been written and used that as his guide to steer his city council. The residents had convinced him that the black smoke that emanated from a burning tank might blow over their particular residential sections and violently explode in the air, and therefore, we should not have any more tanks.

Recently I appeared before another city council meeting in New England where a provision in the new ordinance called for a uniformed fireman to be present at all transfer of petroleum products on water-borne equipment. You can be assured that the taxpayers were not going to be paying for the additional people. I asked the chief if he thought he should assume the responsibility for having one of his people supervise the handling of what he is considering a dangerous commodity. He said, "No, I don't want that on my conscience." That night he petitioned the city fathers to exclude that particular part of the proposed ordinance.

Some time ago in a discussion with the fire marshal of a large city we talked about how unreasonable it was to limit the capacity of storage in underground tankage to one thousand gallons per tank for the maximum of three tanks. I tried to convince him it was more hazardous to transport flammable material through the city than to have it lying in storage and remaining docile in a tank underground and his retort was that New York lets you put 550 gallons in each tank.

Some time ago we were asked if we could get the New England fire marshal and building inspector to approve the construction of a steel dyke around a storage tank. He had never seen one and he was convinced they were no good so denied the permit. It cost us exactly $125,000 additional on that authorization to put a concrete dyke around the storage tank. I dare say if you review the fire records of the API for a 10-year period, you could probably count on one hand the number of times that the product of the tank got into the dyke.



To further convince these two gentlemen that the steel dyke was a satisfactory installation, we flew them down from New England to look at a new bulk plant in New Jersey. Then out of courtesy to the New Jersey fire marshal, we invited him to be there when these visiting dignitaries arrived. The whole data was fixed as far as New Jersey was concerned, and the plant was in operation. While talking to these two visiting dignitaries, he said, "You know, it would be a good idea if we had them install fixed phone chambers on the steel dyke, too."

Why shouldn't I take the opposition? Apparently we cannot afford to pay for the type of talent we need in these municipal fire marshal positions. When you get decisions like those I have mentioned handed down, you can appreciate not only restrictive but very costly provisions will be made in our industry. I firmly believe that we can definitely police ourselves.

Some 30-odd years ago, someone decided that if you wanted to stop personal injuries in industry, all you had to do was to install guards on power transmission points of operation, etc., and yet today we say at this thirty-sixth annual Congress that 80 per cent of our personal injuries are due to human error, and most of our fires are due to human error on the part of the very same people.

CHAIRMAN WELLS: I want to thank all of the members of the panel for the very fine and able presentations of the various sides of this question.

Now we would like to have the audience ask the panel members any question they might have on the subject. What about this question of municipal regulations and what about the question of state regulations? In the presentation of these papers, these gentlemen purposely took sides.

MR. FRED McLEAN [Socony-Vacuum]: I want to clear up the question of state regulations that we are debating because Mr. Risinger, particularly, spoke of two kinds—one where the state provides the standards and another where the state seeks out general standards with definite encouragement to municipalities to modify to suit local situations.

I think we should have it clear that anyone speaking for state regulations as being preferred is talking about the first kind, where state regulations, in so far as possible, preempts not by legal authority, but by mere efficiency and practicality the field of controlling the industry and where the necessity for local ordinances is eliminated.

I can cite a specific instance in the Ohio code that we have had the privilege of completely revising this year. The state fire marshals of the state of Ohio had no proper authority behind him. To compensate for that lack of authority in the hands of the state fire marshal, they had this preface in the inside cover—that these standards are developed in the hope that the municipalities will adopt parallel regulations in their municipal codes to enforce these standards.

I would like to hear something about this type of regulation and where the authority rests with the state fire marshal on an overall basis, the right of the fire marshal to make these regulations, and the authorization of the city fire chief and every mayor and every village official where there is no organized fire department to enforce those regulations.

In other words, in the same regulations is an act giving authorization for enforcement and no municipal codes are necessary for the municipal authorities to step in and enforce them. If you do not have local ordinances, you reduce your problem from 20, 30, or 40, depending upon how many active cities you have in your state on one problem.

Mr. Bowles said that you could not keep up with the trend of progress of the petroleum industry through legislation, and I think it is absolutely true. If you get a law on the books, it is the hardest thing in the world to change. Therefore, any approach to this problem should be through legislation enabling the fire marshal to publish hearings and, if possible, have consultation with the industry to adopt the regulations, and have easily modified procedures set up so that all that is necessary is for the fire marshal to find the laws. If they have to be changed, he gets his advice from industry as to what changes should be made.

It is a terrible job to take an amendment through the state legislature. So I say that state regulation should be clearly defined so the state does such a good job of it that the municipalities don't have to. The munici-

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cipalities are satisfied then because they also have the power of enforcement of those same standards.

MR. RISINGER: I was expecting my opponents to jump on me and to say that that was not the case, and you did not have local ordinances and that it was all up to the state and the state would necessarily increase the size of its fire marshal department. That would be additional expense and it would require that sometimes you go all of the way to the state capital to get a decision on small matters.

MR. MYERS: Probably a higher type of talent would be representing the state, but I dare say to get that enacted through the state legislature it would be a pretty tough job where you have so-called cities of the first class.

I would be elated if it were boiled down to just one jurisdiction. But I dare say we will never get it. I recall one instance where the ordinance was already passed by the local group in a village. They had a very pertinent problem. They had sandbags all through the area, due to the mines, so they required a very substantial concrete pit under the 550-gallon tank. That was to take care of any gasoline that might otherwise carry into those abandoned mines. I asked what should be done with the surface water that filled up the tub, and pushed the tank out of the ground. They didn't know, but it was already an ordinance.

I don't know whether the state was in on that or not, but it was already on the books, and this big concrete pit had to be provided before the tank could be installed.

MR. BOWLES: It is very difficult to limit the prerogatives of any municipality despite the fact that you may have state legislation which states some reasonable ideas. That does not limit your municipalities from promulgating some very, very unreasonable ideas.

We should also take into consideration the administration of such laws and the expense involved. If I know state governments at all, and particularly in these present times, they are limiting rather than organizing or building up the organization of fire marshal administration.

The trouble is that these state organizations are undermanned!

If we do have state legislation passed that is to be effective and administered by the state fire marshal and his co-workers and helpers, it is because some of the companies which are involved in situations are making legislation necessary and are going in the future to let all of their safety endeavors depend upon the activities of such local authorities or such state authorities.

I think it would be cheaper for the petroleum industry and less expensive to make the thing a matter of self-preservation. The undesirables, shall we say, who are not living up to the codes of the standard established by the petroleum industry as represented here, should be made to improve their operating conditions.

I think it would be cheaper to educate them than it would be to educate the whole state administrations.

CHAIRMAN WELLS: I have a question that has been handed to me and I think it is for you, Mr. Bowles. The question is, "Did the city of Alliance attempt to pass an ordinance limiting the size of trucks after the state code was adopted?"

MR. BOWLES: I didn't refer to that particular city. But I have other cities in mind that have similar regulations, and I know of particular instances where such legislation has been passed as a municipal act after the state codes were drawn up.

MR. WILSON: As a member of the NFPA advisory committee for refining liquids, I cannot sit here and watch my fellow workers kick it around. Both of the opposing speakers took the point of view of self-preservation.

We have to protect our fellow citizens. We can police—sure, we can take care of ourselves. I am sure that nobody in this room would go out and take a drink of kerosene, but unless we put the information on the label that goes on the kerosene can, that it is not a beverage and should not be used for spending up fires, somebody is going to get hurt and the oil industry is going to suffer because it is a petroleum product.

Mr. Bowles made the reference to the fact that there would not be diversification to take care of local conditions. I don't recall his exact words, but I would like to call your attention to the way the NFPA is setting up this suggested revision. The state will adopt it and by reference the municipalities can expand it and apply it to the local conditions. The NFPA is not attempting to limit storage. There will be no limitation upon storage, but there will be recommendations for the proper protection and handling of storage.

The National Fire Protection Association suggested that the ordinance does not deal with transportation. That comes under the interstate commerce commission and is well covered in the interstate commerce commission regulations. They are coming up for revision to allow for the increased transportations, or for the increased amount of transportation allowable at that particular moment.

I just wanted to get those points across so that you will understand it is not going to be a restrictive ordinance if and when the NFPA ordinance is passed. It will also be endorsed by the American Petroleum Institute, the National Fire Protection Association, the Fire Board of Underwriters, National Safety Council, and the fire marshals.

CHAIRMAN WELLS: One very practical difficulty that we have run into time and again is taking, for example, that very fine piece of workmanship, the NFPA model local ordinance and assuming that the local ordinance was designed to be used any place.

At any rate, as Frank suggests, it seems that some application of a very fine document or set of recommendations such as that of NFPA, and such recommendations as those of the National Safety Council, might bring up the point of whether or not we need an interpretation by safety men in conjunction with the law enforcement agency. Then I won't go to some town and find a long section cluttering up its statute books covering products that that town will never see.



MR. RISINGER: I believe that the oil industry is going to have to get busy and get into the picture through organized effort to carry information to the public and join with local fire chiefs and everybody else in this work.

MR. McLEAN: I am for regulating for one very important reason. Most of our operators know how to construct and operate our plants, but you will find a lot throughout the country that are not too good and until we do something to stop the construction and operation of that type of plant, you will be having trouble because that is where most of your fire and troubles start.

Secondly, I am for state regulations because we have too many of the municipal regulations to follow as it is, and I think that could be worked out by having the regulations drawn up by a joint meeting of the petroleum industry and fire marshals of the various cities to get your regulations adopted in that manner.

Enforcement of the ordinance can be by local municipalities because it is too big a job for the fire marshal to sit back and try to be all over the state and handle installations all through the different counties.

I would like to see a panel appointed of an equal number of state fire marshals and of petroleum industry representatives. This panel could interpret the rules when special equipment or a special application arose which seemed to conflict with the regulations as they stand today. But it could be properly ironed out in a sectional meeting.

## Maintaining Interest of Employees in Safety in Widely Scattered Operations

**(A Panel Discussion)**

*Discussion Leader:* WILLARD O. LAPE, Safety Director, Arkansas Natural Gas Corporation, Shreveport, La.

*Participants:*

J. B. GEORGE, Safety Engineer, The California Co., New Orleans, La.

TOM PARREAL, Assistant Superintendent, Operating Department, Tennessee Gas & Transmission Co., Houston, Tex.

WILLARD G. WIEGEL, Personnel Director, Lone Star Gas Co., Dallas, Tex.

C. R. CARTER, Division Superintendent of Compressor Stations, Panhandle Eastern Pipeline Co., Jacksonville, Ill.

CHAIRMAN LAPE: This question of maintaining interest in isolated areas in scattered operations is a problem to a lot of us. I have talked to quite a few individuals concerning this subject and, although one or two of them stated it wasn't much of a problem to them, a great majority said it was a big problem and they had given lots of thought to it.

First, I would like to call on J. B. George to give his ideas briefly.

MR. J. B. GEORGE: Being comparatively a newcomer to the safety profession, it has been my inclination to look around and observe for myself what some of our more experienced men are doing to "maintain the interest of employees in safety." In making this observation, lavish undertakings that spared no expense were observed in a few instances. Safety publications that cost several hundred dollars each month to publish and distribute, and annual reports that take as much as three months to work up, are prepared for widespread distribution; some companies spend over $2,000 for a single film covering a small phase of their operation which is of no particular use to them after one showing around their company; elaborate billboards and bulletin boards are erected for the purpose of displaying monthly posters; and page after page of statistics and figures carrying frequency, severity and injury index rates covering every isolated operation, which are usually 99 44/100 per cent meaningless to the average roustabout, pumper and roughneck, are mailed as often as monthly to the boys in the field.

All of these undertakings, plus many more too numerous to mention, are carried out, sparing no expense. Yet, some of these companies who go to almost every extreme possible to create interest in safety among employees in widespread operations are missing the most important and conservative medium available, which is *the monthly safety meeting.*

Politicians long ago learned that the best way to get a point over and create interest in a campaign among the common man, such as our roustabouts, pumpers and roughnecks, was to go into his haunts with carefully prepared material that he could understand.

Yet many companies give little or no thought as to what is going to be discussed at next month's safety meeting where the roughnecks, roustabouts and pumpers are going to be in attendance. The topic of discussion is generally left to the discretion of the superintendent or foreman who is too busy with regular operating problems to give the matter much concern.

While working in the oil fields, before and during my college days, I attended some of the sorriest so-called safety meetings that accomplished nothing other than the dread of having to attend the following month. These meetings were sorry because there had been no preparation for discussion among the men present. Our boss did not have time nor the material available to adequately prepare a subject for discussion as is the situation with many supervisors in the fields today.

Just a little preparation on the part of the safety director or a member of his staff in the form of a few questions or a short lecture on the safety of a particular operation or, subject if sent to the foreman in advance of the monthly meeting will give them something to go on, and many of the excellent ideas they will advance have a lasting effect on the entire group.

I notice that Charles Miller and his staff with The Texas Company go so far as to advertise in their publication and on the bulletin boards just what the topic of discussion will be well in advance of their meetings so the roustabout, the pumper and the roughneck will be able to "sharpen-up" for the occasion.

Just recently, I overheard a good safety man make this statement: "After twenty years, we have just run out of anything to talk about at our meetings." If the safety men themselves have exhausted their supply of subjects for safety meetings, you can imagine how difficult it must be for the supervisors in the field who are confronted with the problem of holding a monthly meeting with their men. And it is the supervisors who are to make or break us fellows who are doing safety work in the oil industry.

It is true that the National Safety Council with its safe practice and health practice pamphlets, safety instruction cards, etc., offer considerable material for discussion at safety meetings, but on the other hand, much of this material is not adaptable for use in the oil fields, particularly in production. The U. S. Department of Labor, the A.P.I. and other agencies offer still other sources of meeting material, but from observation, these apparently are not entirely sufficient for monthly meetings year in and year out. Since this problem seems to be one fairly universal, especially to the safety engineers who are actually doing field work, and certainly a factor in maintaining interest in safety in widely scattered operations, I would like to take the liberty at this time to make the following proposal: That the Department of Accident Prevention of the American Petroleum Institute act as a coordinating agency for receiving and disbursing prepared safety meeting subjects which different companies have used in their meetings in the past. This would simply mean that when a company has prepared material for a meeting to be used in the field and it had served their purpose, this material could then be forwarded to Mr. Stroop's office.

In a short time, one of the finest exchanges of safety material in the world could be accomplished for our industry. This exchange of material would help to keep us informed on the trend of accidents in every company, since it is believed that all safety meeting material is prepared with the thought of previous accident experience in mind in an effort to accomplish a particular objective. In addition, the suggestion should tend to break down the non-exchange information barrier that continues to exist among the safety people in the oil industry.

MR. TOD PAZDRAL: In maintaining the interest of employees in safety in widely scattered operations one is confronted with many of the problems that are to be encountered in any safety program. The only expected difference in a widely scattered operation over a more centrally located operation is to be found in the fact that the safety engineer, with other members of the official family, are not available at the separate meetings.

In order that you may better understand one's inability to attend even a small number of the safety meetings along the line it would be well to present a few conditions covering our operations.

The first operation on the Tennessee Gas & Transmission system where safety is being practiced is only twenty-four miles north of Reynosa, Mexico, with other operations at approximately eighty-mile intervals along the line for over 1300 miles to a point east of Charleston, West Virginia.

Each of the many operations is located in an area where the habits and mode of living differ from any of the other locations. On the extreme south end of the line a great majority of the population is Latin-American, whereas at other locations the population is made up of ranchers, farmers, lumbermen, and on to the northern end, miners.

In driving from one end of our operations to the other the distance entails approximately 2000 miles one way or over 4000 miles round trip, and would consume the greater part of three weeks to complete such a journey.

The safety program of T.G.T. is not a lot different from that being carried out by any other company, whether scattered or collected operations are encountered.

Use is being made of posters, outside speakers, films, training courses by the Bureau of Mines, safety engineer visitation, social functions, and the company "Line" which is our company magazine.

The great hope for a successful safety program is found in the fact that the safety program, along with our other operations, are placed wholly in the hands of the employee at each location. Our every effort is spent in a selling job. Each employee must be sold on the fact that each and every operation is for the mutual benefit of the employee and the company. Until this is done you shall not have a good safety program nor shall you have other operations at their peak efficiency.

MR. WILLARD G. WIEGEL: Lone Star is a type of company that not only produces natural gas and oil, but it transports natural gas through large diameter pipe, over 5,500 miles of pipe line, to 332 individual towns and cities of Texas and southern Oklahoma.

In addition to that, it operates four cycling plants, seven gasoline plants, manufactures and produces various associated products.

In connection with that operation, there is something in addition to the individual safety problems of the individual workman, because we have several hundred customers

who use gas service. So, our safety thinking goes beyond the actual individual and includes the customer who uses natural gas service.

Sooner or later, in scattered operations of that type, you are going to have to place the responsibility for your safety thinking and your safety actions at the local level.

Our foremen, our district managers and district superintendents, our superintendents of compressor stations, our pipe line foremen are the key men of the organization that have to get that safety job done. They likewise have to maintain this interest.

This is our philosophy about safety—that you place it in the place where the responsibility belongs. There are many things that you can do to continue that interest. One of the things you can't do is have frequent safety meetings where a safety engineer is present at all times.

However, Mr. Breeland and his staff of engineers schedule each year approximately 325 safety meetings where a safety engineer is present.

But with 5,386 employees it is impossible to concentrate them all in one given spot where a safety engineer can present to them safety information and practices at regular or frequent intervals. So, again, you depend on your foremen to carry out your safety program.

As to creating interest and maintaining interest in such widely scattered operations, there are many working tools that you can use. Some of them have been reviewed here. But in all of the instances, of even the working tools, we build that around the individual foreman.

For example, last week we had a welder who was cutting a pipe in a bell hole and was burned. At a meeting of the foremen of that entire area during the following week, a safety engineer prepared a chart showing the complete drawing and layout of the pipe approaches to the bell hole and the action that was taking place around there in the cutting process. That was discussed with all of the foremen attending that meeting.

The meeting was planned primarily for discussion of operating problems for the coming winter. But injected into that meeting, in line with this safety consciousness that you are endeavoring to obtain, was a discussion and analysis of how this accident happened and the report on the complete investigation that had been made in connection with it.

Even in cases of minor accidents and minor injuries the foreman makes an investigation of that minor injury and makes the report to Jack Breeland about it. But the approach he takes to it is not one of placing responsibility for the accident but finding out what caused the accident in order to eliminate a recurrence.

There is a certain philosophy about that that keeps this foreman and the men associated with him safety conscious. I want to stress the importance of having every man in our organization safety conscious because we have this other obligation of the hazard we might create to other people who are not involved or concerned with our business. So, you must get safety down to the grass roots and have everybody conscious about it.

We, too, use all of these aids that have been referred to, plus those specially prepared ideas in discussing individual accidents. We have those various safety meetings where a safety engineer is present. But the approach to it is always with the idea that safety is as much a part of the responsibility of the local foreman and the local supervisor.

The safety engineers, in addition to holding these meetings, make frequent inspections of equipment and machinery and plant sites. Sometimes, even before the actual equipment is moved in, Mr. Baland and his staff have consulted with the engineering group as to the safe location of the plant site itself due to hazards of storage and so forth.

What are the various things that can be done to maintain and sustain interest over a continuing period in that program? There are many things, like the company magazine. Wherever possible the safety organization of our company has pictures taken of the safety meetings to give publicity.

This has a good psychological effect on the employees. One of the best ways of showing Joe Doakes that he is a part of the organization is to let him see his picture in that magazine once in awhile. Perhaps that is the only opportunity Joe had to get his picture taken, and, remember, Joe is always more interested in seeing his own picture in the company magazine than he is



in the score by which the Lone Star team softball team defeated Podunk.

Jack Breeland has the second top man of our organization interested in and a member of the Texas Safety Association. He is first vice-president, I believe, of that organization.

Publicize that kind of information and let the men down here that you are trying to get practice safety realize that the men upstairs is also interested in this program.

Then there is the matter of awards, recognition for an outstanding safety job or accident prevention job.

In our company, for example, we operate some 1,200 or 1,500 pieces of automobile equipment that is on the highway constantly, and that ranges from everything from a vice-president's company car to a butane tank traveling the highway. We give individual cards that says he is a safe driver. At the end of the year, if he is a safe driver, he gets that card.

Then there are individual recognitions—and these are things that are almost imperative if you are going to keep this thing alive—that you can give a district or a town plant group, such as no lost time from accidents for a period of a year: That can be a simple recognition.

At the end of five years, in our case, we step out and get them a bronze plaque which says to all of them that this is a safe-operating organization for a period of five years;—and then on up the line.

But the important thing about that is: Don't leave just your safety director sign that recognition. Send it on up through the top management clear to the president, so that when they get that to hang on the wall in their local district they recognize that the president of the organization knows they had the record and he signed the award saying that he knew it.

In one case, to show you how far we go with that personal recognition idea, here a year or so ago one of our boys got a national award for saving a man's life. The company bought him a $140 watch. The president, the vice-president, the operating manager, the safety department, the general superintendent of the transmission division, the department head of the compressor department and all of the local supervisors of the individual involved, plus all of the employees in his immediate organization, were present one afternoon to see him get the national award and the watch which was presented by the president of Lone Star Gas Company.

That has its effect, because it is one thing to say, "You should do this because everybody is for it," but it is another thing to say, "You should do it because we are going to prove to you that everybody is for it."

MR. C. R. CARTER: We all know that it is not difficult to focus the attention of an individual or of a group on any given subject for a short while, especially if that subject is new or has a possibility of affecting the lives of these individuals or the ones they love.

For example, we are all interested now in atomic energy. We are interested because it is a relatively new subject and has a possibility of greatly influencing our entire universe. We are all interested in how it is going to affect us as individuals, as a community, as a nation, and as part of a jealous world.

Safety, on the other hand, is definitely not a new subject; and while we all readily admit its importance to mankind, we find that we must constantly strive to introduce new methods and procedures so that the knowledge and thinking of safety will remain uppermost in the minds of those we contact regardless of what their job might be.

It is our goal to cause each individual to realize he plays a vital part in the lives of his neighbors and fellow workers and that his practice and teaching of safety is his greatest insurance of freedom from personal injury as well as a healthy mental freedom in the knowledge that he is not by his own negligence contributing to the injury of some fellow being.

It is not difficult to create a temporary interest in safety. Such an interest once created can be stimulated from time to time by special meetings, contests, advertising and so on. But even when this is done, we have only accomplished the initial step or function in the building of the safety individual, whose interest in safe working will remain constant throughout the years.

To complete the job, we must furnish careful, intelligent and understanding supervision. This is essential. I do not mean to

say that a safety-minded supervisor is necessarily a good leader. But I will say that a good supervisor is always safety-minded.

Our discussion today deals with maintaining the interest of employees in safety in widely scattered operations. Assuming that most of you are from pipeline groups, I know that your problems are much the same as our own.

The Compressor Division of the Panhandle System, and the one for which the management seems to think I should be responsible, extends from central Missouri, across Illinois, into Indiana, on to the Ohio State boundary line, an approximate distance of 500 miles. This division is comprised of seven compressor stations and it is manned by about 300 employees.

While we realize the necessity for constantly striving to better our safety work, we are not too disappointed in the interest shown by the various station groups. I would like to give you just a brief outline of a few of the more prominent points of our safety program as we conduct it in these seven compressor stations.

Due to the widespread operations of our entire system, it is necessary that supervisors of each group act more or less as safety director, personnel director and foreman for their own particular group.

However, in order to encourage employee participation, most of our safety meetings are conducted by an all-employee group. Outside speakers are sometimes obtained. But usually an entire program consists of employees only.

The main topics of discussion are, of course, accidents as they occur on our line as well as interesting accidents taken from newspaper accounts; safe practices; procedure for the work at hand; safe use of tools; first aid, and other interesting subjects pertaining to safety.

Through the cooperation of the National Safety Council, timely safety posters are prominently displayed on our bulletin boards. Resumés of all company accidents are sent to each station each month. These are also displayed on our bulletin boards.

The company, through our safety department, sponsors safety contests with individual and group awards, and each compressor station and pipeline district has a special bulletin board on which is painted the wording: "This station or district has operated . . . days without an accident." The blank days or blank space is filled in each day with chalk.

If the employee is involved in an accident while on duty, he is required to submit in writing his version of the accident, explaining why and how it happened and what he might have done to prevent it. Very often this explanation in writing does much toward causing the employee to realize his own negligence.

It is my belief that in order to maintain a safety interest among the employees in widely scattered operations a definite safety program is essential. But I am also thoroughly convinced that it is our plant supervision which decides the amount of interest or the success or safety of any such program.

With this in mind, I repeat: We must be sure that we furnish careful, intelligent and understanding supervision.

CHAIRMAN LAPE: Mr. George, in his opening remarks, didn't elaborate too much on a statement about which I would like to hear more. That was the question of foremen or supervisors being too busy to take an extensive part in the safety program itself.

MR. GEORGE: I think the foreman is just the "big cheese" of the whole thing. He acts as kind of a master of ceremonies, appoints the new members of the committees, and just takes complete charge of the thing. I think that he should be furnished something, some sort of topic, for discussion, depending on what the experience has been, say, over the last year.

MR. WIEGEL: I don't mean to leave the impression that this responsibility should be placed on the local supervisory level. These 325 meetings that are conducted when a safety engineer is present are planned meetings. When the foreman or superintendent plans a safety meeting, that is done, if not personally, by a long-distance telephone conversation with the safety department. So, it really is a planned program.

MR. CARTER: Do you think it is better to have no safety meeting at all than to have one that is not prepared?

MR. GEORGE: I do.

CHAIRMAN LAPE: If your foreman has the interest in safety that you would like him to have, wouldn't it be possible for him to have his safety subjects dealing with his own particular operations, the operations the men are dealing with every day, their own present problems?

MR. GEORGE: We do that. A lot of operating problems are discussed at our monthly safety meetings. But we have always got something prepared for them to talk about that takes up 15 or 20 minutes. We cover some specific problem that has been causing accidents—maybe not there, but somewhere else—and a lot of operating problems are gone over.

MR. PAZDRAL: Mr. Lape, I think the statement Mr. George made that the supervisor is the "big cheese" is quite all right. But I think it would be much better if the whole safety organization were set up on a more democratic basis where you elect your chairman from the floor, your secretary, your treasurer, just whatever you want to have, and set up some bylaws for local conditions that conform to and abide by the company policy as established by management.

Let the foreman be a ramrod. Let him be in the background and check with the chairman that presides for a month or three months' period to see that they do have a program each time, and not get up and take an active part at each and every meeting.

I think if you give each individual an opportunity to get up and express himself, regardless of whether or not he gets over a great deal of information to the assembled group, the individual himself has acquired a great deal of confidence and knowledge that he would not otherwise get.

MR. GEORGE: I think Mr. Pazdral may have misunderstood me. The foreman, even though I said he is the "big cheese," is always the chairman. He picks the individuals to handle certain safety discussions and names the committees and so on. But probably at the safety meeting he wouldn't say a 100 words altogether.

Our management wants the foreman to act as chairman at all safety meetings in order to insure responsibility. If you have a floor that needs to be fixed on a well, and the inspection committee or somebody says that it needs to be fixed, your chairman can't do a thing about it, but the foreman can.

MR. MEADE CORLEY [Phillips Petroleum Company, Odessa, Texas]: I would like to ask you: Is the safety meeting held on-the-job or off-the-job?

MR. GEORGE: It is either the first hour in the morning or the last hour in the afternoon—at the tower change in the morning or the change in the afternoon.

MR. CORLEY: Then you are still controlling that meeting as a company organism instead of it being a meeting of the men for their benefit?

MR. GEORGE: It is part of their eight hours a day once a month to take an hour and go to a safety meeting.

MR. PETER PHRYDAS [Plantation Pipe Line Company, Atlanta Georgia]: Don't you in a way go a little further back than your meetings? I think possibly you have what you might call conscious and unconscious meetings. What I mean by that is this: Your conscious meetings are where they are planned, because every time a foreman gives job instructions that in itself is a safety meeting.

Have you ever listened to your foreman give job instructions on a job and see if he gives his men the safe method or does he say instead, "Hey, Joe, you go out there and do that"?

MR. PAZDRAL: I think we should pay a lot more attention to examining *near* accidents and not always wait until someone gets hurt. A great many things happen in which no one is hurt that are certainly bad practice, and they should be discussed and talked about.

CHAIRMAN LAPE: In these isolated areas, who is to do that investigation, both on the accidents themselves and in these near accidents?

MR. PAZDRAL: The supervisors and the committee that is appointed at the regular safety meetings. Have an investigating committee where you have more than one department, and have an equal number, one or two men, on this committee from each department. That committee can make a routine investigation.

MR. CARTER: In an isolated place, where there are very few employees and you ask the supervisor to inspect it and give the reason for the accident, isn't it quite often the case that this supervisor is partly responsible for this accident himself and possibly wouldn't make the proper report on it?

MR. PAZDRAL: That is definitely true. You will find in most cases a lot of supervisors will lean one way or the other, depending on their responsibility. It takes a very good foreman and a safety conscious foreman to put down the facts as he sees them regardless of where the blame may fall.

MR. WIEGEL: Investigations produce better results, I think, if you approach them on the basis of accident prevention rather than placing the responsibility or blame for the accident. You get an entirely different attitude and an entirely different reception of that investigation.

CHAIRMAN LAPE: Sometimes it takes a pretty good diplomat to do that. I wonder if you wouldn't talk to us about tying in all of your training programs to these foremen on their responsibilities in accident prevention.

MR. WIEGEL: We don't call supervisory conferences training programs because it sounds a little bit silly to get a group in a room like this, some of them who have had 25 years as a supervisor, and say to them, "Well, boys, we are going to train you to be supervisors." So, we call them conferences.

These conferences are built around two paragraphs called "principles of supervision." We stress the idea that because the man is at the meeting he has super-vision. The reason he is a foreman is that he does something better than somebody else.

Those supervisors assemble at some central point, stay there over night in many cases, and have their expenses paid, to attend that 10-hour session. It covers all of the principles of supervision, placing the responsibility of this thing called management at the level where it can be used, because he is the man who is doing the supervising.

MR. J. P. WEST [Sohio Pipe Line Company, St. Louis, Missouri]: I would like somebody on the panel or somebody in the audience who has had experience in safety committees to tell whether they are useful or not.

MR. GEORGE: We have two committees. We use a roustabout and a pumper and an engineer, acting as a committee of three to investigate the accidents. If there is an accident, they just drop what they are doing and go make the investigation.

I think those two committees have helped us a lot.

Down in the marsh lands they are given a boat at the beginning of the work day, and if it takes all day they take all day.

CHAIRMAN LAPE: How do we know those meetings are going on and what kind of report back do you get? What do you require from these meetings in the isolated areas where there is no member of the safety department other than the foreman in attendance?

MR. GEORGE: The district superintendent gets a copy, and I get a copy myself. We have minutes, and a lot of things come out in these minutes.

The other day we had a situation in Colorado in which we needed the sewer system put in around a trailer camp. It had been proposed through regular channels by our engineering department, and it was turned down by the division superintendent. We didn't know anything about it in New Orleans, and the thing was taken up a little higher and the approval was granted. The job was reopened.

MR. C. M. CREAMER [Creole Petroleum Corporation, Caracas, Venezuela]: Posters, as a means of maintaining interest, were mentioned before. I would like to have some idea as to how often posters should be changed.

Secondly, I would like to know what the feeling is with regard to bringing in outsiders, that is, people from different districts or different areas, to investigate serious accidents?

MR. CARTER: I don't believe any poster should be left up more than two weeks.

MR. PAZDRAL: I think a week is long enough. There shouldn't be more than one or possibly two posters on the bulletin board at any one time.

MR. GEORGE: Two weeks.

MR. A. E. BREELAND [Lone Star Gas Co., Dallas, Texas]: I think to be most effective they ought to be changed every day, and if they are on there three or four days they don't see them any longer. But that isn't practical so we change them every two weeks.

MR. HOLLEY P. BRADLEY [Stanolind Pipe Line Company, Tulsa, Oklahoma]: Who changes those posters? How do you know they are changed every day or every two weeks?

MR. GEORGE: I stamp on the poster: "Post on the first day of the month," or, "Post this poster on the 15th day of the month." Then when I go around and I find one that is not changed, of course, I place the responsibility. The clerk is responsible for seeing the posters are put up there.

MR. BRADLEY: We use the reverse process. We tell them to remove the poster on a certain date.

CHAIRMAN LAPE: The second question the gentleman had was concerning borrowing individuals from another district of the same company.

MR. CARTER: I don't think it will work very well because of the ill feeling with regard to one group in the same category censoring another group in a like position.

MR. GEORGE: We had an experience with that at two fields—one at Brookhaven and one at Cranfield, Mississippi. The fellows at those two fields would compete in golf, basketball and softball, and they worked up quite a rivalry. We took one committee over to inspect the other's property. It happened that one of the Cranfield boys was reading a report regarding Brookhaven, where they had not had an accident for over a year. This fellow was pretty critical, and one of the boys asked him what the frequency rate was at Cranfield, which he knew was very high. It just didn't work out at all.

MR. V. O. HENDERSON [General Petroleum Pipe Line, Los Angeles, California]: When Mr. Carter presented his paper, he said that when an accident report is submitted they ask the injured man to write his story of what happened, how and what he might have done to prevent it.

*Might I ask: Do you do that in all cases,* or in those cases just involving lost time?

MR. CARTER: We do it in all cases, especially those with lost time. I say "especially" because occasionally in the shuffle it is overlooked and if it is of a very minor nature we continue to overlook it.



MR. HENDERSON: Do any of you in your organizations make the wearing of safety shoes compulsory? What do you return to them of the purchase price?

FLOOR: The wholesale price, less a dollar.

FLOOR: The wholesale price, f.o.b. factory.

CHAIRMAN LAPE: The wholesale price—I think that is the general practice.

MR. HENDERSON: That is all right if you stock them. But if you go to a retail store and they order them from the factory, what do you do then?

FLOOR: We gave a dollar. We did do that. But now we are buying them directly from the factory.

MR. HENDERSON: My organization up until now has had to buy them retail, and we return 25 per cent of the purchase price with a minimum of a dollar. However, we are going to stop that ourselves pretty soon.

MR. E. M. McCRACKEN [Shell Pipe Line Corporation, Houston, Texas]: I will tell you what we do. We have on-the-job safety meetings and off-the-job safety meetings. The on-the-job safety programs are run by the foremen because they are held on time. That is paid for by the company. Our off-the-job safety programs are on the employees' time, and we let the employees run those.

The chairmen operate under a set of by-laws. Those fellows they elect might not know how to run these meetings, so, we bring each year these officers of the 29 safety chapters into a central location, and they are taught how to conduct meetings, and we give them some material with which to conduct their meetings. Then they send reports to us, and they work with our safety engineers in running the meetings. This works out very well.

## Training Employees for the Safe Operation of Natural Gasoline and Cycling Plants

(A Panel Discussion)

*Discussion Leader:* A. W. BREELAND, Supervisor of Safety, Lone Star Gas Co., Dallas, Tex.

*Participants:*

H. W. BOOCOCK, Personnel & Safety Director, Sinclair Prairie Oil Co., Tulsa, Okla.

R. E. BUCKNER, Plant Superintendent, Gas Division, Humble Oil & Refining Co., Houston, Tex.

PAUL F. LINDEMANN, Safety Engineer, Gasoline Division, Phillips Petroleum Co., Bartlesville, Okla.

J. M. KINDLE, Assistant Superintendent, Gasoline Department, Lone Star Production Co., Dallas, Tex.

CHAIRMAN BREELAND: I am going to call on Mr. Boggess, to give you his theory in training employees for the safe operation of gasoline and cycling plants.

MR. H. W. BOGGESS: All of us have seen a great many oil operations—be they gasoline plants or pump line operations, producing fields, or what not—that have had very good physical standards, excellent operating conditions, good tools and good equipment, and which were maintained that way but still have produced high accident frequencies.

At the same time we have probably seen installations where the maintenance was poor, the upkeep was bad, the tools, equipment and machinery were not up to standard, and in those cases occasionally see a pretty good accident record. What is the difference between the two? The difference, I think, is the personnel that is running daily the risks of injuries at those places.

You have got to have men in any operation who, first of all, have good health. Certainly they must possess a positive know-how for the particular job, and, not the least of all, they must have the proper mental attitude to get a job done.

Perhaps the weakest link that we have in this chain of safety is man himself. Particular attention must be given to his selection and then, of course, to his proper placement and his proper training.

Certainly most progressive organizations today do have a pre-induction physical examination. A great many more progressive companies have a very standardized physical examination.

In isolated properties and in areas where a gasoline plant may have just a few employees—20, 30 or 40—it isn't possible to have your own physician right there to do the examining. So, you probably have to have somebody whom you have on a fee basis.

But just having a man to send a man to, to get a physical examination, is not enough. Perhaps the physician knows nothing about the type of duties the job this proposed applicant is supposed to do. How can he conduct a good physical examination without having that knowledge?

I think it is up to the personnel department to see that the company's physicians in cooperation with the medical department are well advised of the nature of the duties the applicant is to perform. Unless the physician has that background, he would have a difficult time in saying what he should rule him out for.

Then certainly we know that a pre-employment physical examination would not insure a continued state of good health over a whole tenure of employment covering several years or many years. So, periodic physical examinations come into the picture.

There is another item. You are not going to have a safely run plant without good healthy men. In periodic physical examinations, the man you examine today may be in good health and five years from today he may not have good eyesight, thus not being able to read correctly your gauges; or he may have high blood pressure which will drop him off your tasks when he is gauging, and certainly he may have an incipient diabetes that will affect his whole efficiency and even show up in and affect the black figures in your balance sheet of that plant if you don't know something about his physical condition.

Certainly the men have got to have certain mental as well as moral qualifications. I don't think you can hope to get every roustabout or every mechanic or repair man who has been to Texas A & M. Certainly he doesn't have to have a technical education. But certainly he should be able to read and write and should have normal judgment. How we are going to determine these things we can discuss a little later on if you would like to get into detail.

But most of all I think his moral standards deserve scrutiny. We are finding in America today some pretty loose thinking, and it is affecting the lives of all of us as a group. A man who is the chronic "kicker" and the chronic grouch is the rotten potato in the sack that spoils the gang and causes the whole outfit trouble.

You can do a great deal in selecting your men. It will pay you to weed out the rotten potatoes in advance.

A man who doesn't pay his debts or who



lacks a sense of responsibility is a poor applicant—and you can pretty well determine that before you hire him.

I don't think it makes any difference whether your personnel department does the hiring or whether your foreman on the job does the hiring. It is still controllable.

I think, too, it is about time in this country all of us in industry started looking toward these people we put on the payroll to see we get only those who have a faith in our own country and our democratic systems.

MR. R. E. BUCKNER [Plant Superintendent, Gas Division, Humble Oil and Refining Company, Houston, Texas]: After Mr. Boggess has selected these men and gotten the men he thinks would be qualified for training, it is the superintendent's position to take over and try to see they are properly trained. He must have a lot of help, and this help must come from the immediate supervisors. However, it is necessary that he also have support from top management, and this support must help to see that the supervisor is properly trained in order that he can efficiently train the personnel.

These men must be properly selected. They must be physically fit and possess an alert mind, and they should have a natural ability to operate machinery and related equipment.

The superintendent should strive to see that the employees have a thorough knowledge of the equipment, its location and how it should be operated. He has got to see that they understand the characteristics of liquids and gases and how they are processed through the plant, and, naturally, they should understand the effects of thermal expansion, static electricity, and how to prevent or avoid the hazardous results of either. A knowledge of proper methods and kind of equipment to be used on different types of fires is also of utmost importance.

It is generally conceded that the immediate supervisor or foreman is the main contributor to the job of safety training and that a good foreman can do more than all others combined to prevent accidents. Therefore, the superintendent should be anxious that the foremen have certain qualifications and be properly trained.

An efficient foreman will have, among other assets, a sincere interest in people, an enduring patience, and have the ability to put himself in the place of a person of lesser knowledge and experience. He should be able to talk to rather than down to people. Furthermore, he must have a thorough and practical knowledge of the job.

The superintendent realizes that, in maintaining a successful safety program, it is necessary to have the full cooperation of management and the training department in supporting as well as in preparing the foreman for doing his best work.

The employee's training begins with his induction into the organization. At this time he is made acquainted with company policies, which include the various plans, benefits and so forth. He is also informed of what the company expects of him in the performance of his work and in the observance of safety practices.

As the employee's safety attitude may be influenced by his first impression of the job and the people with whom he will work, the superintendent should see to it that the employee is introduced and welcomed on the job in a fitting manner. However menial the task may seem, the employee should be made to understand the importance of his job and its relation to the operations as a whole.

It has been found that where a sense of ownership is developed it tends to encourage responsibility, promotes an enthusiastic attitude toward the job and pride in the organization.

In normal industries an employee can be shown what, how, why and when to perform certain duties. Then, if he follows instructions, he will work safely. But this is not necessarily true in our business.

Due to the possibilities of various kinds of accidents, including the unpredictable failures of equipment, we must train our employees to be able to think and act safely and effectively under adverse conditions. Admittedly, this is no small task. But it affords a real opportunity for the foreman and training department to render an invaluable service to the safety program.

On-the-job training by an efficient foreman usually gives good results and, where it is possible, this should be augmented by vocational training.

During the war some companies were successful in getting the men to voluntarily form groups of two to four men in a

team and, from flow sheets prepared by each team, they would give illustrated lectures on the proper operation of the plant. This proved to be an excellent method of training for both safety and efficiency.

Thus, we see the superintendent has a great responsibility in the training of employees for the safe operation of natural gasoline and cycling plants.

By intelligent cooperation between executive, superintendent, safety engineer and personnel manager, a comprehensive program can be set up that will add impetus to the entire safety organization, which will, in turn, make for better relations between management and labor.

MR. PAUL F. LINDEMANN: Before commenting on the subject of training employees for safe performance of operational duties in natural gasoline and cycling industries, I should like to point out that such training is only half of the work and responsibility of the safety engineer in these industries. Safe performance of everyday operational duties is concerned only with the education of the operator and the control of safety factors which are within the personal control of the operator.

In other words, the safe performance of operating personnel assumes that the equipment operated is adequate from the safety standpoint in every respect. This being the case, the safety engineer has an important function prior to the consideration of operators' performance in the safe design and arrangement of the operating equipment. This function is in every way parallel to the work of the design and operating engineer who contribute to the construction of a plant.

In the design of a new plant, the safety engineer must become familiar with the detailed layout of operating units and with the proposed duties of each workman. He must then use his imagination and his knowledge of the proposed operations to foresee and forestall any procedures which could conceivably involve hazard to personnel or property. He should promptly advise designers, or his management, of any design or practices which by his analysis are unsafe.

In old plants it is necessary that each unit of equipment be studied to determine its efficiency for the current operation. Any factors, such as corrosion, erosion, metal fatigue, hydrogen brittlement, etc., which might be contributory to progressive deterioration and to eventual failure, should be periodically checked and records of each such inspection kept in order that equipment may be removed from service before operation actually becomes hazardous.

Although "experience" may indicate that an operating unit is "safe," some change in operating practice or deterioration of the unit itself may be the cause of serious failure and the safety engineer must always be vigilant in uncovering any such condition. A program of personnel training which is not coupled with an active program providing safe operating equipment can hardly be expected to yield favorable overall results in the form of a good safety record.

In our opinion, the training of the individual workman should begin from the very moment when he enters company service. Insofar as it is possible he should be instructed in every detail of the job for which he is hired and hazards, if any, should be pointed out to him with instruction as to the preferred safe method of operation.

Then, recognizing the limited ability of the individual fully to absorb information relative to the new job or situation, the indoctrination teaching should be supplemented by a follow-up instruction at intervals until the new employee can perform his duties both efficiently and safely.

Although opinions differ on the subject, we feel that for the safety of all concerned there are certain situations in connection with the production and handling of gasoline which can best be handled by strict working rules in the form of an inviolate "don't." I refer in particular to such practices as the carrying of matches or spring lighters and to the practice of smoking in restricted areas.

We must always contend with those individuals who will claim that restrictions of this nature are an encroachment on personal rights and privileges. We feel that common sense is in favor of eliminating any act of carelessness or thoughtlessness on the part of the few individuals who can be counted on to abuse such personal privilege. Where there is any possibility of the presence of free vapors, we should certainly not permit the presence of any source of ignition.



With the exception of a few restrictions or working rules in the "don't" category, it is our opinion that safe operation may best be taught by the opposite approach of instructing each individual in the preferred method for doing each unit operation. We are currently involved in a training program which has as its ultimate aim the preparation in written form of job instructions which will stand the test when considered from the viewpoint of ease, efficiency, and safety.

Each unit job in operation or maintenance is considered to determine the various ways in which the work could be performed before choosing and writing out that method which meets the requirements of trained operating supervisors, engineers, and the safety representatives. Not only does this program teach the individual who has been on the job for many years and is unwittingly indulging in unsafe practices, but the program also serves in the teaching of new personnel entering a job classification for the first time.

We look forward to the day when we need no longer rely on haphazard training of operators and maintenance men by supervisors, who may not fully appreciate the teaching responsibility incumbent upon them and when we can be sure that each individual is furnished specific instruction with respect to an easy, efficient, safe way to do his job.

CHAIRMAN BREELAND: I think we should now hear from management's attitude toward this business of training employees for safe operation.

MR. J. M. KINDLE: The natural gasoline and cycling plant industry has made considerable advancement in technical and mechanical facilities in the past few years. The quality of the personnel available for the safe operation of these facilities has kept pace with this improvement. This, in my opinion, has been accomplished because the proper training of employees has been given the same consideration as that given any other operating problem.

The industry, as a whole, has been quick to see the benefits derived from a comprehensive, well planned program of employee training. Some of these benefits are as follows:

1. *It tends toward the elimination of human suffering.* If this were the only reason for a training program, it within itself would justify the expense and trouble involved. An employee can be compensated for the time lost due to accidents and for the cost of medical attention, but money cannot repay him for the pain and misery that accompanies torn bodies and broken bones.

2. *It contributes greatly to improved employee relations.* Good employee relations are founded upon the group's confidence in management. A well organized, all inclusive program for the training of employees properly and safely to do the work required of them is appreciated by the individual. It is the sum of this appreciation on an individual basis that determines the degree of good employee relations.

I know of no other single factor that contributes more to the group's confidence in management than the general feeling among the employees that management has a sincere interest in their physical well being along with the feeling that management is affording them the opportunity to do their present job well and, at the same time, to increase their knowledge to the extent that they can advance to a better job as the opportunity presents itself.

3. *It is sound business from an economic point of view.* A properly conducted employee training program will over a period of years yield a great financial return. I know of the experience of one company that operates four cycling plants and seven gasoline plants whose compensation insurance rate has been reduced 72½ per cent during the past 14 years. Applying this percentage factor to the 1947 cost of compensation insurance, an annual saving of $44,000 was made in actual cash that would have been paid out in compensation insurance premiums if the rate had remained the same.

In my opinion this reduction in rate and resultant saving in cost can be attributed to this company's and other similar companys' training programs which have been successfully conducted during this period. It seems only reasonable that improved results can be expected as these training programs are improved and expanded.

The annual saving of $44,000 is only a portion of the total saving. It represents only the saving in direct cost of injuries. Various estimates have been made of the

indirect cost of accidents as compared to the direct cost of accidents.

Using the ratio of four to one as a basis for calculation, this one company is experiencing a total annual saving of $220,000 in the cost of industrial accidents. Multiply this figure by the great number of companies who have had similar experiences and you will readily see that the problem of proper training of employees merits our continued best efforts.

There are other benefits to be derived from such a program on which it is difficult to place a definite value. If it were possible properly to evaluate the amount of the saving due to increased efficiency, we probably would find that the program could be justified for this reason alone.

When we analyze and appraise the results that have been achieved in the past from certain activities and methods, we can see that we have an excellent basis for future planning. On the basis of our experience, our future plans should be patterned after our past program with emphasis on certain phases of the program. We have found that it is not sufficient for management to say that employee training is a good idea and that it should be done.

On the other hand, we have found that it is necessary to have a well organized program with specific plans to accomplish definite desired results. In order for the program to be effective, this idea must be sold to the entire supervisory group from the top down. Special emphasis must be placed upon the importance of the part that the supervisory group that actually direct the work has in the program.

The greatest burden and responsibility for the success of the program falls on the men that direct the work from day to day. Experience has proved that if a thorough selling job is done and that if the supervisory group, at all levels, are actively engaged in directing the program, it is bound to be a success.

CHAIRMAN BREELAND: I want to start off by asking our personnel man one question. I was much concerned about the condition of moral fitness.

Mr. Boggess, I would like to ask you this: How much of this moral investigation are you able to do before the man is actually at work? If you are not able to do it all beforehand, which I assume is not so in all cases, how soon after his induction is this work done?

MR. BOGGESS: An employee with us is on temporary status for the first six months. During that time he is not entitled to any of the emoluments that go to the permanent type of employee, such as group insurance and so on. He is really on trial during that period of six months.

Of course, it is possible in every individual case to know a lot about the man before you hire him. While we meet him pretty quickly, our ties are rather replete in each instance with a man's background.

But you don't get that sort of information from reference letters.

Usually there is somebody assigned to the personnel department—it may be one of our safety engineers in the field—who is in the area where this man worked a number of years. If he is there at the time the man is under consideration or on probation, he finds out certain data: Has he been paying his grocery bills? Is he a family man? Has he been divorced a dozen times? Is he a drinker?

MR. BOGGESS: I think perhaps every company is striving to so train its employees that every employee feels he himself is a safety man. That is the ultimate end of a safety program, and you don't have a chance to do that unless you hire and have on your payroll men who have the proper attitude—a sense of good sportsmanship among men and fair play. That sort of fellow is right for a safety program. If he doesn't possess it, he is not a good moral risk.

MR. KINDLE: We are continually hiring men for construction jobs. Some of them are "boomers" and some of them are looking for permanent jobs. But we pick a large number of our permanent employees from these construction groups. A man doesn't start accumulating seniority until he has been there six months. So, when we hire them and put them on an operating job to start with, we watch that six months' deadline pretty closely.

MR. BUCKNER: Instead of a six months' period, we have a 12 months' period. It gives us a little bit longer. And we have a system of giving a man a written notice before he is let out. Well, in this first year, if they realize that they can make a year with us, they are in pretty good shape, and we try not to give them a written notice during that particular time because they will perk up and make a pretty good hand until their year is out—and at that time they get insurance and other benefits from the company they did not have the first year. In fact, they are temporary employees for one year.

MR. MORGAN [El Dorado, Arkansas]: Mr. Boggess, what is the minimum amount of information you find out about a man before you terminate at the end of six months?

MR. BOGGESS: That is more or less left up to the local supervisor. Morals is one of them. I am stressing that because I think it is tremendously important. If a man doesn't have the ability to acquire the proper techniques for his job, of course, we don't want him. He may come with fairly good recommendations as to his work experience, leaving us to believe he has those techniques, but on trial he doesn't have them. So, we let him go.

MR. M. H. MILAM [General Petroleum Corporation]: I would like to know this: When you hire a man as an operator, do you, under your six months' period of time, go around and ask the men he is working with and tell them whether they have any stake in this man being there or not, whether he is fully qualified or not, and they are going to have to hold up their end of the stick with a man that is undesirable?

MR. BOGGESS: We don't hire a man as an operator in the first place. He comes up through the gang.

MR. MILAM: I think Mr. Kindle said occasionally they hire operators. In the last three or four years we have had to do that. Where do you get them? Sometimes a man is qualified.

MR. KINDLE: If my memory serves me rightly, we have never hired an operator. I might say it would be pretty hard for us to do it.

MR. MILAM: No doubt some of you have not had the choice in the last several years of being able to hire all the labor up through the gang that you mention. You have had to hire them in some of the lower classifications. I think that is true.

Have you made it a point under your six months' or year's business to tell the fellow who had to work with him, the head operator, whatever you call him, and the men under his direct supervision they are going to have to get along with that particular fellow, that the job is going to have to be done?

MR. BUCKNER: In our case, it isn't necessary. They will tell you that, anyway.

MR. D. M. FARRELL [Shell Pipe Line Corp., Houston, Tex.]: Mr. Breeland, I might mention that we have practically the same plan. The new man is carried as extra help for a period of six months. During that time he is watched pretty closely because we know eventually he is going to get on our seniority list. But he can't get on until the end of that six months.

Prior to the time the man comes onto the regular payroll, his supervisor, immediate supervisor, makes out an employee's appraisal report. That appraisal report goes from the first supervisor to the district or division superintendent and he, too, makes an appraisal report of that employee, and that goes to the employment office and we look over his requirements and what they have said about him. Then if it is approved in our head office, he is actually taken on as a regular employee and comes onto our seniority list.

MR. BOGGESS: In those instances where you hire men for foreign service, you have to hire for a specific, higher grade job classification. We hire the driller, the derrick man, the motor man, the Diesel mechanic, the gasoline plant operator—the specific man. In that instance our checkup is three times as thorough as when a man goes in a gang here in the States because we put quite an investment in that man in sending him to Ethiopia, Colombia or some other place. We must know about him.

We happened on one little idea, so far as foreign employment is concerned, that has been of tremendous value in lessening labor turnover. The men who have not had foreign service go into a foreign country where the whole environment is different—it is different from everything they have been accustomed to—and a lot of them get pretty homesick.

That costs us all a lot of money when that happens. There is just one thing that has been tremendously successful with us. We are not hiring any extrovert for foreign

service. We are hiring only introverts. It works.

MR. MILAM: After you hire a man, do you make any specific effort to tell that man where he stands? Is there any check to tell that man his work isn't satisfactory, or do you wait until the last minute and say, "Brother, we are *through with you*"?

MR. KINDLE: Very often one of our supervisors will have a list of these men who have been with us less than six months. He will send in forms taking them off the payroll. One of his stock reasons is that the men working with that man say he is no good. He watches the man and checks up on him. When he sees himself that the man will not be a desirable employee, he will terminate the man.

MR. MILAM: Does he tell the man at any time about his deficiency?

MR. KINDLE: No, he doesn't give him any notice. You can't do that.

MR. MILAM: The reason I asked that question is that the company I am working for has come up with that situation a time or two where safety problems have been involved. We have the same rule—six months. They work up to six months and then they decide whether to cancel him out. If they cancel him out and the safety end has been all right, if there has been nothing wrong with his work so far as accident prevention is concerned, you have a big hullabaloo as far as this employee relations you have been talking about is concerned.

I had my stock man say, "I asked my lead supervisor and he said he was satisfied with my work. What I want to know is: When did I go bad?"

That has caused us some little concern in our employee training program. Usually the supervisor has been right.

We have one man who has been with us for about four years. He has turned out to be one of the best men we have, and we were going to terminate him. He complained about it, and the complaint went high up in the company and they gave him a hearing on it, on his own.

We have found out we would probably be better off to require the supervisors to caution these people.

MR. KINDLE: I think you ought to have as good a reason for letting a man go before his six months' period is up as you have afterwards. You are not being fair if you don't.

MR. S. P. BEARDEN (Warren Petroleum Corporation, Tulsa, Oklahoma): Assuming you pick a good workman to begin with and he lasts out one year, two years, three years, maybe four or longer, and by your periodic check on him you find he is physically inadequate or has become physically inadequate for the job and you have to replace him or move him, what provisions do you make or what steps do you take?

MR. BOGGESS: We do have that situation, and particularly in my own company, which is a rather old organization, where our average age right now throughout is 48 years and a little over eight months, which means a lot of the men are in their early 50s or late 60s on work jobs. Naturally many of them are falling prey to various illnesses or various conditions, which are disabling them and making them hazardous for their particular jobs.

There you come to the problem of placement. Because a man has always worked with a pulling gang and has gone up and worked the board—maybe he gets in a position where he can't do it any longer—what are you going to do? Are you going to fire him because he can't go on and continue to do what he has been doing? Certainly not. I don't think any company would do that with an old man. It is a question of replacing and reclassifying the man into another job. We do that continuously, and I think most other progressive companies are doing it. I think it is the only decent thing to do.

MR. BUCKNER: Without reduction in pay.

MR. BOGGESS: Yes.

MR. LINDEMANN: I am wondering how many companies represented here today use exit interviews with their employees. Before you give the worker his paycheck, don't you sit down and have a talk with that individual and find out why he is leaving if possible? If you do that, you may find out something about your own organization you didn't know. This man might be willing to speak quite freely, since he is no longer affiliated with your own organization.

MR. KINDLE: That is one of our standard questions. We ask a man why he is resigning, quitting, and we record that in that man's personnel record if we possibly can.

MR. MORGAN: When we have a man leave the organization, the first man he talks to is the safety engineer in his particular department—and for several reasons. Some of them are that he has prescription goggles that he might want to turn in or he might want to take with him, and some other equipment he might want to turn in.

The safety engineer has a talk with him and trys to find out why he is leaving, why he is quitting. Many time we find out some things we didn't know. Then the head of the department talks with him and, if it is convenient, the personnel department has a talk with him. Of course, he has to come through the personnel department to handle various papers and get his last check, and he is talked to at least three times. We have found out some things about our own organization out in the field that maybe we wouldn't have found out other wise.

MR. BOGGESS: Do you do a physical on him when he is terminated?

MR. MORGAN: No.

MR. BOGGESS: Do you, Mr. Lindemann?

MR. LINDEMANN: No.

CHAIRMAN BREELAND: Our supervisors are asked to make a job analysis—not as we ordinarily think of a job analysis, but his individual observations of the individual or individuals on specific jobs at intervals—and make a record of that. If the man raises any questions about his fitness or unfitness, it should not be a difficult job, if he has done these things he was supposed to do, to tell him why he is being let out.

MR. WIEGEL: On our final payroll form we just don't say "quit" or "fired." There is an analysis on that payroll form.

On this business of exit interviews, we don't make a formal interview in all cases, but in many cases we do. Within the last two years we reduced a supervisor because of six people, who left the company. They had not all been talked to. Two of them had been talked to. The other four had not been, and we brought the other four back to the company after they had been gone for a period of time before we decided to take the action on the supervisors.

MR. MILAM: I am very interested to know, from a safety supervisor's standpoint, on upgrading of jobs, and training programs in natural gasoline and cycling plants, whether you make a special effort at all when you move a man up from one spot to another to put him on with an old, qualified operator.

MR. BUCKNER: We put him on with an old man and try to give him all the assistance we can in training. We give him training on the job as well as an opportunity to train him off the job, vocational training.



## Safe Repair of Leaks on Pipe Line Containing Volatile Liquids and the Reconditioning of Loaded Pipe Lines Over-the-Ditch

**(A Panel Discussion)**

*Presiding:* D. M. FARRELL, Assistant Personnel Manager, Safety and Training, Shell Pipe Line Corp., Houston, Tex.

*Discussion Leader:* W. F. BURRIS, Assistant Safety Director, Phillips Petroleum Co., Bartlesville, Okla.

*Participants:*

JESS B. BARNETT, Maintenance Superintendent, Interstate Oil Pipe Line Co., Oxford, La.

HOLLEY BEASLEY, Safety Director, Stanolind Pipe Line Co., Tulsa, Okla.

R. L. MATHESON, Safety Engineer, Panhandle Eastern Pipe Line Co., Kansas City, Mo.

JOHN WEST, Safety Engineer, Sohio Pipe Line Co., St. Louis, Mo.

MAX WEST, Division Superintendent, Gas Pipe Line Division, Magnolia Petroleum Co., Houston, Texas.

A. L. YEATES, Assistant Maintenance Superintendent, Phillips Petroleum Co., East St. Louis, Mo.

CHAIRMAN BURRIS: In this discussion we intend to cover the three major phases of pipe line repairs, leak repairs of pipelines containing or carrying (1) crude oil, (2) finished products and gas and, (3) the reconditioning of loaded pipe lines over-the-ditch.

The first gentlemen who will present his remarks *is Mr. Holley Bradley. His* discussion will be on leak repairs and oil pipe lines.

MR. HOLLEY BRADLEY: Since our company does not recondition pipe line over the ditch, or loaded pipe lines over the ditch, I shall discuss only the safe repair of leaks in lines containing volatile liquids. We have condensed this job considerably and we will move right on into the safe repair of those leaks.

*For example,* we take every precaution that we can to prevent accidents in these leak repairs—beginning with the excavation of the line preparatory to locating the leak. *If there is a lot of petroleum vapor present,* or if the line contains hydrogen sulphate, we have the employees engaged in that repair operation wear approved gas masks and they will wear these masks until all flammable vapors and oil have been cleared from the area.

In the excavation we have the dirt thrown back at least two feet from the edge of the ditch or three feet from the edge of the bell hole. That provides adequate space for the employees to move around the excavation.

If the depth is more than about five feet or if it has tendency to cave-in, we use *trench jacks to prevent caving.* If we don't use trench jacks, we will make the ditch as wide as it is deep, thereby providing a space for a man to escape in case the ditch does cave *or by using shoring* methods, we can slope the edges of the bank to prevent caving.

As a precaution against fire, we have all of the employees remove from their pockets all matches, even though they may be safety matches, cigars, cigarettes, lighters, welding torch lighters, flint lighters, or any source for igniting the vapors which might be present.

We *also keep internal combustion engines* a safe distance from the flammable vapors and if possible, on the windward side of the leak, until all of these vapors and oils have been cleared from the area preparatory to doing the repair job.

Of course, we would have approved fire fighting equipment present on all repair jobs. Some employee who is familiar with the operation of this fire fighting equipment would stand by to man that equipment in case of *fire* and he continues to stand by until the repair has been made in case it happens to be a permanent repair.

Of course, for pit hole leaks and collar leaks, we would make a *temporary repair* and then make the permanent repair later on.

Every time a leak is reported on one of our pipe lines, the station pumping through that line ceases to pump through it until temporary repair has been made. If it is a pit hole leak or collar leak, a temporary repair is made and they resume pumping operations after the temporary repair has been completed.

*Before any welding would be done in* connection with any repair job, the line pressure at the point of the repair job would be reduced to a maximum of 200 pounds of pressure. We would not attempt to make any permanent repair job on a loaded pipe line without having all of it moving through the line in order to keep it cool on the inside to prevent a probable burn through the line, or to prevent it from buckling.

MR. JESS B. BARNETT: There are several types of leaks that require different methods to safely repair, even though the basic and fundamental principles of repair are the same. I want to call your attention to a few of them. The techniques of making repairs safely will be brought out in the discussion that follows.

We have *pit holes,* with corrosion inside and outside, and they are repaired practically the same but safety precautions are different in some respects. Then we have collar leaks and there are three types of those. The small ones don't take much to repair and are not very dangerous.



The most serious collar leak is that which may be spraying gases in the air caused by a jumped thread and, now and then a thread will pull completely out of a cock. This would be classed as a line break. It is more serious and more hazardous in repairing.

In the old style type of well pipe of which there is much still in the ground, you have split joints. You may have a one-inch or a four-foot split.

The newer type of seamed tubing sometimes have breaks and cracks in the pipe or a sand hole in the weld. All of these leaks can be safely repaired providing the proper tools, material and equipment are available and the men doing the job know their business.

The reconditioning of pipe lines over the ditch is one of the most hazardous jobs the pipe line man is ever required to do.

The different phases of reconditioning pipe lines over the ditch that you may be interested in that we will discuss are stripping, raising, caning, turning, lowering and the pressure on the line, while welding. We don't hesitate to weld on 450 pounds of pressure.

CHAIRMAN BURRIS: We all recognize that in a great many instances the safety problems are exactly the same regardless of type of line that we are repairing, but in many important respects it varies greatly, depending upon what you are pumping through that line.

*Mr. A. L.* Yeates will talk to you very briefly on that subject.

MR. A. L. YEATES: To begin my talk, I am going to assume there is a leak at a time when the pipe line is carrying natural gasoline. I will say it is 18-pound vapor pressure natural gasoline and the leak is near a main thoroughfare. The leak has already been reported and we are called in to make the repair. The first thing the foreman will do is approach the leak on foot and leave his equipment far enough away so that it would be out of any dangerous vapor area.

The second thing he would probably do would be to determine the direction of the wind to see which way the vapors would be blowing if there were any vapors present.

Then the third thing he would do—and I am trying to get them in their proper sequence—would be to observe the saturated area to see how far out this gasoline had spread so in placing his men and equipment they would be as safe as possible.

Then we would probably bring out a couple of fire extinguishers and set them about 25 feet from the bell hole where he was going to make his excavation. He would then move his equipment and trucks and so forth to a location where he was positive they couldn't be included in the vapor area.

Then, he would, no doubt, use spark proof shovels and picks, if necessary, and would make the excavation. If the soil permitted, he would cut steps in the side to allow the men to get out. Being near a highway, he would station a couple of men along the road to keep the traffic moving through. If anybody attempted to stop he would insist that they keep moving. We would not want spectators on a job of that kind.

As he proceeded with the job, if it happened to be on solid rock or something of that nature, he would strip back far enough so he could, if possible, lift the line and place the saddle in position while the line was in operation.

We do not shut down the line unless we have to. If the pressure is too great and we cannot saddle it with the line pressure on it, we do request a shutdown but we try to do it without that.

We make a temporary repair, saddle the leak, and some time later make the permanent repair. Being near a highway, we fence the location, fence the bell hole, and place "Inflammable" signs around it, and on both sides along the highway. Of course, we get rid of all *liquid gasoline.* The gasoline is pumped out with a one-armed johnny or some other method. We leave it like that until the hole is cleaned up by the sun, rain, and so forth, and then come back and weld the saddle on at a later date.

It is important when putting on the saddle to inspect the pipe very carefully for pits close to the leak pit. If you got the edge over a thin spot in the pipe and the welder went to weld it on, he might burn through the pipe.

MR. JOHN WEST: I would like to briefly outline the experience we have had. First of all, we had a good many accidents where men got very seriously burned because of improper procedures and equipment

being used on the maintenance of pipe lines. So we tried various methods of eliminating these accidents. We finally came to the conclusion that the only thing that could be done was to write a manual telling exactly how this work would be done.

The manual stipulated exactly what equipment was to be standard equipment for all welders and all maintenance crews and in certain cases we set up safety trailers. In these trailers all of the equipment necessary to perform a certain type of work is included. When a leak is discovered it is only necessary to connect the trailer. They know they have the proper equipment available at all times.

We held a school at one of our division headquarters where all of the supervisors, welders and truck drivers came in for a week and a half to go over all of the procedures and actually do a mock-up job on the various kinds of work and practice operating the fire fighter equipment. After that we put the whole portable school on a one-and-a-half-ton truck and moved it around to every location that we had. We had every man in our operations go through that same school for a day and a half, so there would be no excuses for the men not knowing what procedures were supposed to be used.

Now when they come to repair a leak, the first thing a foreman does is set up the area for working. In general, the working area is about 150 to 300 feet in diameter, depending upon the conditions in that area. Only men who are doing work are allowed in that area. No automotive equipment is allowed in the area until it has been declaired free of vapors. The reason we did that was because we had seven men very seriously burned because of a flash fire that was started when a tank truck which was pulling out with the products from the bell hole backfired and set off a flash.

We, of course, have the fire extinguishers dismounted and manned. We have set up a procedure for using what is called a muller, a plugging machine, to plug off any lines which have to be repaired.

They have to plug the line with a plugging machine and set in a vapor pack and apply the proper vents. We also had a very serious accident where the mud pack was placed in the line and no vent was placed back of the mud pack. The pressure built up during the heat of the day blew out the pack and sprayed products all over the welder. He will never get out of bed again.

We insist upon the use of the bonding cable and we also use safety weil cup links where it is necessary to put a line together. That is a safe way of putting the line together and we use water displacement also whenever possible. It is not too practical in most cases, but where it is possible we favor that. Of course, it eliminates all of the danger.

Moreover, when a line has been shut down and the pump stations have been shut down, the only man that can go back and tell the pump station operator to resume operation is the foreman of the maintenance crew. We have had cases where the men get mixed up in their instructions. The foreman wanted pumping to start in an hour but instructions got mixed and they started pumping in 30 minutes by mistake. As a result, they had an accident.

CHAIRMAN BURRIS: Would you want to take a little time now to discuss your over-the-ditch reconditioning?

MR. JOHN WEST: We do very little of the over-the-ditch reconditioning. We specify that there will be no welding on pit holes which are a certain depth. That will depend upon the size of the pipe. If it is over a tenth of an inch, for instance, in depth, they cannot weld on it. In most cases where it is very corrosive in the general area we try to concrete the whole line rather than to try to patch it up. Anything that is over the maximum for welding must be patched.

MR. R. L. MATHESON: We keep fire extinguishers available and emergency kits available that contain all of the necessary equipment to repair a leak. Thus we take no chance of getting out on the job without some necessary part of our safety equipment.

Most repairs on gas pipe lines are of the permanent rather than temporary nature since we don't have the liquid products to contend with. We vent the gas in the air, put a sleeve or patch on the line, and at the same time, put a vent on that patch and run the vent pipe up above the ditch. Before we start the repair, especially the welding on the line, we of course, light the gas at the top of the ditch.



We use a safety clamp as near our welding operation as possible. This is a heavy clamp which we install on all large diameter pipe lines that are under pressure. We have found that when our lines do blow out, especially on our old lap welded pipe lines, tearing takes place that rips down the whole joint. We found that the fodder on our cup link will stop this ripping. If a man would ever start to open up we would control it and find it would stop before it blew out a whole joint.

MR. MAX WEST: I am connected about a line in Texas that is 200 miles long and it is what you call a subsonic line. In that 200 miles we have no booster or compression stations. In other words, we just let the main pressure furnish the horse power.

For that reason, we have to go to extremely high pressures on account of the pressure drop. It is strictly natural gas and dehydrated. Before it goes into the system we dehydrate the gas. As the pressure drops, we go into a larger line to take care of the volume of gas. It is dry and used strictly for fuel.

When we start out, we put on an initial pressure of 1000 pounds, three to one, and have extra heavy pipe. As we go down the line, we can go to lighter weight pipe because of pressure drop and not having any booster stations. About the lowest we get at the terminals is around 200 pounds. We hold around 300 to 400 pounds and we have quite a reserve of gas when they hit us with a maximum load.

This line was built in '41, so it is a fairly new line and of good steel. In one area we did have a hot spot or corrosion and within 600 feet we put on 58 half soles or patches on pits which had not quite broken through the side. They were about the size of a half dollar or a dollar and cone shaped. We had found out back in the early '30's that it was very safe to arc weld on good pipe of this kind.

Naturally, we took the precaution that the other speakers have explained for safety in approaching the leaks. In one place we had one that we were especially concerned about. This leak was about four feet long, about as wide as your hand, and a quarter of the way through the wall of the pipe. It started on one side and snaked around to the other side. That would have caused a complete break that would have been very dangerous. We hot welded that with 600-pound pressure on the line.

On another occasion we had a bulldozer putting on the line. It is a wonder it didn't burn him up before he ever got off his bulldozer. It so happened that he jumped and cut off his motor. It happened to be a Diesel and we had to drain a 13-mile section.

We have gate valves every 10 miles, and we can block it off every 20 miles. Therefore, we have to cut down the refinery for fuel and all gas wells. It causes quite a bit of trouble.

At another place where the government was constructing a canal a bulldozer got on the line and caused a 9-inch split in the weld. We used a repair sleeve with a vent and a 3-inch vent to take care of it. One of the men was in the bell hole repairing it. We take every precaution insofar as the men are concerned.

As far as I know, that is the only type of 14-and 16-inch line without a booster station. We save the cost of building and maintaining a booster station, making it a gas man's dream line. You just have one customer—that is, the refinery, and you don't have any small pressure taps on the outside to the pressure points.

We have five pressure points and the dispatchers check automatically every hour. The majority of the time the refinery is letting heavy every thirty minutes. We use meters at 50 points and have three sets of dispatchers. One is for each end, and one for the middle. They are in contact with each other continuously and these meters are in most dangerous places. We can go back 50 miles and tell the pressure at any point at any time.

If we have a leak or loss of pressure, we can discover it at once and go out and check into it.

*Discussion*

MR. A. ROSS ROMMEL [Humble Oil & Refining Co., Houston, Texas]: I have a situation where there is a long field and we handle from a well, or a series of wells. I think the pressure probably would average around 4,500 pounds, and, on some occasions, you have to install flange spools to tie in a lateral from other distillate wells. The type of pipe you use is anywhere from

three-quarters of an inch to one inch thick (hydraulic), and it is not possible to make a cold cut on the line. I would like to get the opinion of this panel as to what might be the experience in handling similar situations. We cut a section out of the line and put in a spool and then tie in a lateral to it, and, of course, that is connected up to other wells in the system under extremely high pressure.

CHAIRMAN BURRIS: It is a little bit out of the ordinary. Has anybody here got any ideas?

MR. BARNETT: I would like to ask what the test pressure of the pipe is.

MR. ROMMEL: The test pressure would be 10,000 pounds.

MR. BARNETT: Do you contemplate putting in this connection without cutting the line?

MR. ROMMEL: No, I will tell you what we are doing, as I want to get the opinions of other people. You have a line anywhere from two to three miles long, coming off individual lines into the gas plant. We have been bleeding the line down to slightly above atmospheric pressure and cutting out the section of the desired size. When we do that we have little flame involved if the pressure is above atmospheric. We make a hot tap and tie a vent into the line where that can be ignited, to relieve pressure. You cannot cut it with a cutting tool.

MR. BARNETT: I have not had any experience in gasoline lines.

MR. BRADLEY: I would suggest that you use a P. and H. tapping machine which is invented and patented by our company.

MR. ROMMEL: How big a hole would it tap?

MR. BRADLEY: Just about any size of hole you would want. We tap holes in our lines—in our 16 inch lines—big enough to run 40,000 barrels to 60,000 barrels a day through. You can tap the line under any amount of pressure. You could tap it under full pressure if you wanted to and that would be my suggestion for tying in your lines as long as you do not have to run a scraper from the wells which you are tying into this other line.

If you don't have to run any object through there—like a scraper or bulldozer—it would be my suggestion to use this tapping machine.

MR. ROMMEL: Will it tap pipe as heavy as ours satisfactorily—up to about 12 inches, or up to about a 12-inch combination flange?

MR. BRADLEY: I wouldn't use the flange if I were to do that. I would use a special clamp for clamping on the connection for tying in the other lines. I presume you will use a welded line.

MR. ROMMEL: Yes.

MR. BRADLEY: That is what I would do. I suppose you men are familiar with the P. and H. tapping machine.

MR. ROMMEL: Yes, I am familiar with the machine, but we have not tried it on that line. We have been more or less following the general practice that is used on long gas lines.

MR. BRADLEY: It certainly is a tough problem.

MR. ROMMEL: It has concerned us a little bit, but so far we have been fortunate.

MR. BRADLEY: I would like to know about anything you develop later on because we have the same problem. The device I mentioned before is called a Paulson and Hill tapping machine and we also tap our tanks in tying in adjacent lines.

MR. ROMMEL: You have given me a good lead.

CHAIRMAN BURRIS: Is there anything else?

MR. HARRY M. WILLIAMS [Texas Eastern Transportation Corp., Norris City, Ill.]: Has anyone here had any experience in using the asbestos suit either for equipping welders or rescue men around either a natural gas or products break? If you have, I would like to know what experience you have had. One man told about having an experience where the suit itself filled with vapors and when the fire broke out the man was burned worse than the men who were not equipped with asbestos suits. The asbestos suit actually became a blanket. We are equipping the crew with asbestos suits, and I was just wondering if anybody could give me information on asbestos suits.

MR. BARNETT: We have used asbestos suits in bell hole repairs and gas vapors are not too strong. We do it in case of a flash and we have never had any experience with them accumulating gas.

MR. WILLIAMS: Before this accident occurs .. the man had been working in a



stream of gas. It was not a high pressure stream, but just a good steady flow from a large diameter pipe and apparently in moving around, there was an opening in the suit so that vapors got inside and when they flashed he was severely burned.

MR. R. E. BUCKNER [Humble Oil & Refining Co., Houston, Texas]: I have a suggestion that has occurred to me on the fire blanket or asbestos suit, we should have some sort of inert gas that would go either in the blanket or in the suit like nitrogen or carbon dioxide. In that case there wouldn't be any flame inside because the nitrogen or carbon dioxide would extinguish it. You have a blanket you can roll up in, but when you roll up in a blanket and begin to press that fire to the skin, it is pretty hot, and I imagine a suit would be the same.

CHAIRMAN BURRIS: We had the same experience with an asbestos suit. That sounds like it might be a solution to it. We discontinued the use of the suits after we got a man pretty badly burned.

MR. BRADLEY: Had you considered how badly the man would have been burned if he had not had the suit on?

CHAIRMAN BURRIS: This was a rather unusual case. We were preparing to do some welding and were cleaning a tank. The gas was to blow through an exhaust system for air circulation, and we thought we could get by with it. But there was enough gasoline in the suit to ignite when he struck an arc.

MR. BUCKNER: In the product line, you will find a considerable area where you could use the spark proof tool. They are not spark-proof—they may be called spark-proof, but, nevertheless, when they strike certain objects in the ground you may have a spark. We haven't had any flash. It probably was not the right mixture.

MR. J. FRANK SCOTT [Southern Natural Gas Co.]: When we find an area frozen we use water in addition to our spark-proof tools and as we go down we keep the area saturated with water. In certain sections of Alabama, two flints will hit together so we keep the area thoroughly saturated with water. It will take many barrels of water if you are out in some isolated area and we have not had any trouble. We still use the spark-proof tools.

CHAIRMAN BURRIS: Having used the water, do you think you will have appreciable hazard using steel tools?

MR. SCOTT: No, I don't think you would with the area saturated with water. I am not too concerned over using steel. I believe the water would keep the spark that might drop from a steel tool to a minimum intensity that would not flash the gas anyway, as you have to have a certain degrees of heat with the spark.

MR. BRADLEY: Did you have trouble before you started using this water? Had you had flashes.

MR. SCOTT: We had one flash.

MR. BRADLEY: You had one flash, too, didn't you?

CHAIRMAN BURRIS: Yes.

MR. BRADLEY: I was wondering if the extreme low temperature didn't reduce the flammable product below the ignition point and that was the reason I asked the question.

MR. SCOTT: In this particular instance, we had a flash when we were excavating and digging the bell hole with the line under pressure.

MR. BRADLEY: That way you had the vapors that were not below the ignition point.

MR. YEATES: Which one of the spark-proof tools were you using?

MR. SCOTT: Pick.

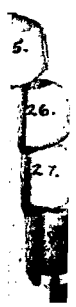
MR. YEATES: We had a fire started the same way with the berillium pick.

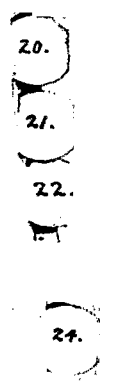
MR. SCOTT: I am not thoroughly sold on these tools, because I was on a job where we were using a copper sledge on the pick and you could see sparks. I am beginning to doubt if there is any such thing as a spark-proof tool.

MR. JOHN WEST: There is a lot of literature on that now, both for and against the spark-proof tools, and some feel just about them like they do about a drag chain on the back of a tank truck.

MR. SCOTT: I will go along with the spark-proof tools.

MR. JOHN WEST: You were saying you used water to wet down the area, but let's assume the ground is frozen. You must have some freezing weather. Isn't it extremely difficult to use water? In other words, doesn't getting the water around just add to your troubles?



MR. SCOTT: No, we have never had any trouble with freezing weather. We have had frozen areas from escaping gas and the temperature up to 40 or 50 degrees above freezing.

MR. JOHN WEST: I was thinking about where you have freezing weather.

MR. SCOTT: We haven't run into that during freezing weather. If you had temperatures down to 10 or 12 above, naturally the water would freeze more quickly.

MR. SCOTT: Mr. Bradley made a statement I would like to ask about. In your opening remarks, you made the statement that after you clear a given area around a leak of flammable vapors, you sent the welder in. How do you determine when the area is clear?

MR. BRADLEY: We have explosive mixture meters in each area. However, we don't use them extensively. We just go on the theory that as long as none of the vapors are discernable, when we start we are safe. By the time we get through clearing the oil out, we would certainly have the vapors cleared away unless it would happen to be in the bottom of the bell hole and that usually is clear.

In all of my experience I have never seen a bell hole flash where we were testing to see if vapors were there, that is if we were cleared.

MR. BARNETT: I would like to add a little to that. In some cases we have had oil heats and the grounds crack down several feet and in those areas we have had to dig a larger hole around the bell hole itself and let this oil seep into that hole. We had to keep it cleaned up and put fresh dirt inside the bell hole before we could do anything with it because it just kept seeping out of the ground.

MR. BARNETT: In one case we had a leak in the same kind of ground and six weeks later it was still burning in the ground in those cracks. There was no oil on top of the ground.

Mr. E. M. McCRACKEN [Shell Pipe Line Corp., Houston, Texas]: When you get that mud plug in the line, you were talking about building up pressure. How do you add that line?

MR. JOHN WEST: We always tap it with a tapping machine, either with a Whitely or Muller. First we weld on a safety type nipple and then use your tapping machine, tapping through a gate valve. When you take your machine over you close the valve and that way you control it. We always put the vents back far enough so that if we had a leak there it would not be in the vapor area.

We never just knock a hole in the pipe. We always tap it, use a safety nipple and a gate valve so that in case something does go wrong, we have control over it. In that way we don't just have an open hole there that nobody can plug up.

MR. YEATES: We put the mud plug in the very last thing and as soon as that is in we know it is clear of vapors and the welder can go ahead and weld.

MR. McCRACKEN: Do you keep a safety line on your welder?

MR. YEATES: No, but I think it is a good idea. We have thought about using one to help him out of the bell hole.

MR. McCRACKEN Do you let his helper stay down in there?

MR. YEATES: We don't unless the helper has to hold something up in place. We don't let anybody stay there, but the welder.

MR. BARNETT: I might add a little bit to that venting. We sometimes cut a hole in it especially where they want to vent it where there is oil. We then weld a collar on a patch and tap through the patch and gasket. We put that on with clamps. Then we take the clamp off after we get through and if there is no pressure on the line we put on a solid patch, welding if the oil is all right.

MR. JOHN WEST: Why do you do it that way?

MR. BARNETT: In case there is any vapor around the area that we want to tap through.

MR. JOHN WEST: Why don't you just use a nipple? Why put the saddle on first?

MR. BARNETT: We put the saddle on and the nipple in the saddle to keep from having to use a welding torch in that area.

MR. ROMMEL: Do you use that in connection with the mud plug, too?

MR. JOHN WEST: That is right. We always use the mud plug. If you have a grade on one or both sides of the place you are going to cut you cannot be absolutely positive that the line has completely drained. I don't understand how you can ever be positive of it if there are any hills and valleys between the place you are going to cut and your highest point. You will always get some of the product held up by air pockets. Every now and then the air pockets will let go and allow a slug of gasoline or crude oil or whatever you have in the line to run down. We have had that happen. We have no sooner placed our mud plug and here comes a big gob and pushes the mud plug out. We make sure by putting a rubber plug in the line, which is supposed to hold up to 150 pounds. We found if you get over 100 pounds the plug will start leaking a little. So we never depend upon them for over 100 pounds, and they cut it down to 50 or 60 pounds.



MR. ROMMEL: But you do vent—

MR. JOHN WEST: We also have the vent between the rubber plug and the vapor plug. A man is stationed to gauge at all times. He can tell immediately if the thing lets loose and if there is any seepage that might prove dangerous to the man working.

MR. JOHN U. PARKER [Humble Oil & Refining Co., Tyler, Texas]: We are comparatively new in the operation of the gasoline lines, and we had one experience that I would like to find out about. I wonder if it is common practice with you men. The first time we run a scraper through our lines and got the scraper in the trap, we pulled it out and had three streams of flame. I imagine the mixture was too rich to ignite or we would have had a good fire. Since that time we have been saturating or turning a stream of water on the vapor in the trap prior to pulling it out. We have not had the flash we had that first time. Is that common? Have you had any experiences like that?

MR. YEATES: Yes. You might try grounding it. You might have had a static electricity spark at the time. Is that what you thought?

MR. PARKER: Yes.

MR. YEATES: We just reached in and pulled them out. It is grounded there. Do you have a rectifier or transformer attached to the line any place?

MR. PARKER: I don't think so. Mr. Rommel, do you know?

MR. ROMMEL: No, they don't have any at all on the line.

MR. YEATES: It might be grounded and they could also insulate the trapper off.

MR. BRADLEY: You thought definitely it was static spark.

MR. PARKER: No, we didn't know.

MR. BRADLEY: How was it being removed—by force.

MR. PARKER: We just came in and grabbed on to the bale and jerked it out.

MR. JOHN WEST: What kind are you using?

MR. PARKER: I don't know.

MR. BARNETT: Is the scraper trap larger?

MR. PARKER: Yes.

MR. BRADLEY: Had the line contained iron sulphide that was in your sulphur traps that had been removed from the walls of the line?

MR. PARKER: We got a lot of matter out of there, and I don't know what it was.

MR. McCRACKEN: Didn't you say it was a gasoline line?

MR. PARKER: Yes, it was a gasoline line.

MR. ROMMEL: I think there was an accumulation of mill scale. For this we use a circular type of scraper and the purpose of the scraper is to remove this mill scale. The line is about 200 miles long and mill scale could have accumulated on the outer circumference of the scraper itself. When pulled out, it just grated against that steel container and a flame resulted from the metal to metal contact.

MR. YEATES: Does your scraper fit that tight?

MR. ROMMEL: Yes, I think the accumulation of mill scale got cut and that hay expands inside of the perforated openings in the strainer.

CHAIRMAN BURRIS: Does anybody else have something to add?

MR. H. D. SOLSBERY [Shell Pipe Line Corp., Cushing, Okla.]: In speaking of these sprays, you mentioned putting clamps on. We have the MSA Blower type of mask and some of the boys claim in working in these bell holes the fumes get inside of the mask through the exhalation valve. I was wondering if anyone else had had

similar experience. The face piece fits perfectly, but still the fumes in the spray get inside the face piece.

MR. BARNETT: We use that type of mask but have had no complaints.

MR. JOHN WEST: We have had complaints when the man is moving around.

MR. BRADLEY: They have the new type of valves now made of neoprene which the oil and petroleum vapors won't affect. On the cannister type of mask it was found that the walls of the valves had become thick and the valve was not functioning as it should function. We changed to the neoprene type of valve and got away from it. On the blower type of mask the only trouble we had was that the guy operating the blower would get a little lazy and would not pump enough air. They should build up enough pressure inside of the mask in order to have some coming out continuously.

MR. SOLSBERY: I was wondering if it was blown in that opening.

MR. BRADLEY: If it did you couldn't get vapors through.

MR. SOLSBERY: There might have been a skip in pumping.

CHAIRMAN BURRIS: We nearly lost a man in hydrogen sulphide. The mask had certainly been checked very carefully before being used because we were very well aware of the extreme hazard. In moving around apparently he must have bulged the side of the face piece a bit yet they were pumping all of the time. There were two men and one inhaled enough hydrogen sulphide to collapse.

There have not been any questions above the ditch reconditioning.

MR. JAMES SKIPTON [Zurich Insurance Co., Houston, Texas]: What is the standard practice in reconditioning a line above the ditch when you are uncovering, say, 30 or 40 miles, and you are going to do that work under pressure. What reduction in pressure do you operate the line at?

MR. BARNETT: That would depend upon the pressure you are running. Our system is 1909 up to 2200 pounds. We don't hesitate to weld on 450 pounds or on the lower end of the system without a reduction in pressure. In certain cases we have worked on pressures up to 500. Up to a few years ago we welded on 650 pounds which was top for that type of line.

MR. SKIPTON: Suppose you had a butane line or something like that, would you operate normally? Where you operate normally about 800 pounds.

MR. BARNETT: If you had high pressure pipe, I think you would be reasonably safe in welding on a line 150 pounds lower than your working pressure. I would reduce the pressure if it was top safe working pressure for the line.

MR. DON ATTAWAY [Arkansas Fuel Oil Co., Shreveport, La.]: When preparing gas lines over-the-ditch with pressure in them, have any of you had any experience with a line with a number of customers on it, and you don't want to cut off the supply of gas to them?

MR. MATHESON: We have a triple line.

MR. ATTAWAY: If it is at all possible, isn't it the intelligent thing to cut the line completely and split the flow the other way? Isn't that the right way to do it? The reason I say that is because we got smart and were just going to reduce the pressure and we killed two men, and put four in the hospital.

MR. MATHESON: Over-the-ditch reconditioning is something we have never done.

MR. ATTAWAY: We just killed two men and put four in the hospital, and I say that the thing to do is to get the pressure completely down and fire it from another line.

MR. BARNETT: That would be all right in the gas business but in the oil business it so happens that between 1932 and 1948 we reconditioned hundreds of miles of pipe lines and have had seven no lost-time injuries in doing that work and only one from burns.

MR. ATTAWAY: Isn't it a fact that your working pressure is considerably lower than what we have in gas distribution?

MR. BARNETT: Our lines would stand 650 pounds and we run 450. I don't know what your line pressure is.

MR. JOHN WEST: We operate on 1,000 pounds and reduce them down to 250—no higher than that. It seems to me you have an entirely different problem with gas than crude oil and gasoline because you cannot do anything to hurt anybody if you break through a line to gasoline and crude oil except to get a stream of fire. I have seen



that happen a couple of times while the man is doing it. We have a man stand by with a fire extinguisher and put the fire out and put a clamp on and weld around, but, of course, that isn't standard practice as far as we are concerned. What I am pointing out is crude oil and gasoline lines can't possibly hurt anybody unless you fail to use the necessary safety practices.

MR. ATTAWAY: We have had the same experience on gasoline lines. We attempt to do the same thing you are talking about on gasoline line pressure, and we got some men burned doing that. Since then we have absolutely gotten away from trying to attempt any repairs under pressure. We made a hard and fast rule not to make any repairs under pressure because we have had too many unfortunate experiences.

CHAIRMAN BURRIS: I want to thank all of you gentlemen for your attendance and cooperation.

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[On October 20, 1948, the Petroleum Section met at a luncheon meeting to honor Roy S. Bonsib, Standard Oil Co. (New Jersey). Roy was the first General Chairman of the Petroleum Section and since the inception of this group he has lent his ceaseless and untiring efforts to the promotion of safety and the establishment of proper relations between the Oil Industry and the National Safety Council. The gift presented at this luncheon, indicates, in only a small way, the high esteem that his fellow petroleum safety engineers hold for Roy Bonsib for his more than 25 years of active participation in the Petroleum Section Executive Committee.]

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PRINTED IN U.S.A. 48 1700—449—WHP


**Current Safety Topics in**

# POWER PRESS OPERATIONS

**As presented in the Sessions of the Power Press Section at the National Safety Congress**


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**Volume 20**
**Transactions**
**1948 National Safety Congress**


NATIONAL SAFETY COUNCIL

# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE POWER PRESS SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Power Press Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Power Press Section carries on in behalf of its members, and for the benefit of accident prevention work in power press operations generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of plants operating power presses. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on pages 14 and 15 of this volume.



## Human Factor as a Cause of Injury

By BASIL BURNS
Chief, Accident Investigation and Statistical Section,
Western Electric Co., Inc., Chicago, Ill.

The human factor is one of the outstanding causes of injuries. The *National Analysis of Punch Press Accident Experience* shows that 79 per cent of cases reported resulted from unsafe practices. Nearly all safety men agree that unsafe practices are indices of the human factor at work. Some hold that unsafe practices reveal faults for which blame (responsibility) should be fixed. Others hold that unsafe practices are results of mistakes made by the person who causes the accident and that help to prevent continued repetition should be offered.

It is important that, whatever our approach may be, we think about unsafe acts or the human factor.

I. If we adopt the "fault theory," our follow-through or corrective action must be based upon enforcement and punishment.

II. If we adopt the mistakes theory, our follow-through will be based upon:

A. Defining and understanding the nature of the mistake.

B. Analyzing the reasons for the mistake (The unsafe practice factor—A.S.A. *Recommended Practice for* Compiling Industrial Accident Cases—Z16.2—1941—Part I.)

C. Mobilizing the entire resources of our plants to assist personnel in avoiding these mistakes (engineering, enforcement, education).

1. Selection and placement
2. Integrated personnel policy (counselling, health, etc.)
3. Cooperative supervision
4. Education and training.

What do the Analysis show regarding the human factor as a cause of punch press injuries?

I. It shows that in four out of five cases some unsafe practices were isolated. This means that the human factor is vitally important in any consideration of control of punch press injuries.

II. It shows that too little significance is attached to the unsafe personal factor. In 80 per cent of the unsafe acts no unsafe factor is indicated. *Page 8, Paragraph 2.6 A.S.A. Z16.2—1941, Part I,* states:

The unsafe personal factor is the mental or bodily characteristic which permitted or occasioned the selected unsafe act, e.g., *improper attitud*: (Disregard of instructions, failure to understand instructions, nervous, excitable, etc.); *lack of knowledge or skill* (unaware of safe practices, unskilled, etc.); *bodily defects* (defective eyesight or hearing, fatigue, intoxication, existing hernia, weak heart, etc.)

Unsafe personal factor is important because it determines (1) whether training is needed (problem may be one of placement or enforcement), and (2) the nature of the training needed.

III. Most unsafe practices are related to the feeding of the press which is not surprising since that is the most obvious exposure.

Forty-six per cent of unsafe acts relate to feeding.

1. Thirty-four per cent of these feeding mistakes involved "failure to use the hand tool." (It would be interesting to know in how many cases such tools were provided.)
2. Seventeen per cent of feeding mistakes involved "placing hand under punch (power on)." These feeding mistakes are related to the lack of guarding and emphasize a fundamental principle—the control of the work environment is always a more positive preventive measure than reliance upon control of the human factor.
3. Eleven per cent of feeding mistakes involved "stepping on treadle in advance of operation."

IV. Nearly 20 per cent of these mistakes involved set-up, adjusting and cleaning. One-third of these were "failure to shut off power when making adjustments."

V. Other areas where costly mistakes were made were:

1. Fifteen per cent involved misuses of guards. More than one-half of these involved "reaching around guards."
2. Handling scrap and materials, team work and personal protective equipment account for the remaining 19 per cent of the unsafe acts.

## Guarding Problems as Injury Cause

By L. A. FAULKNER
Liberty Mutual Insurance Company, Boston, Mass.

I was asked to discuss the guarding problems that appear to be the predominant causes of the cases as shown in the *National Analysis of Punch Press Experience* that you have received.

Out of a total of 273 cases, 151 occurred where the was no guard in use or the guard was ineffective. I believe that some cases listed under *press deficiencies* belong in this same grouping. There are three under the sub-heading of *broken barrier guard*—1 *worn cage guard*, 1 *sharp edge gate guard*, and 1 case resulting from a *loose collar on a swing guard*. This gives us a *total of 157* accidents out of 273 or 57 per cent occurring on either unguarded or ineffectively guarded operations.

To me this indicates (1) a lack of understanding of what constitutes adequate guarding, (2) the lack of the "know-how" of punch press guarding, and (3) an improper evaluation of the extent of the punch press problem and the development of a well-balanced program. On this basis, let's discuss these items one at a time.

1. What constitutes adequate punch press guarding?

   An adherence to the new American Standard Safety Code for Power Presses and Foot and Hand Presses B-11.1 or some state or federal codes should constitute adequate guarding. However, I'll go one step further and cite a few simple standards that have been the secret to the success of the punch press program in some plants.

   a. All primary operations shall be provided with individual die guards or adjustable press barriers.

   b. All secondary operations must be provided with automatic or semi-automatic feeds to eliminate "under the punch" manual feeding. Such dies must be provided with individual die guards or press barriers used.

   c. Under conditions whereby feeds and die guards or press barriers cannot be used, hand tools and some specific type press guard must be provided. By press guard, I refer to some type of pullback, sweep, two-hand control, etc.

2. The second item that this analysis shows is an apparent lack of "know-how" as to punch press guarding.

   What is this thing called "know-how" of punch press guarding? To my way of thinking, the "know-how" of punch press guarding consists of an attitude of mind plus the application of a few simple mechanical engineering principles.

   If management honestly wants to operate a pressroom minus accidents and production interruptions, it must take a definite stand on the subject, be willing to spend the money; and the "know-how" is usually available within its own organization if properly guided.

   This "know-how" is available in the reference material and consulting service of the Power Press Section of the N.S.C., U. S. Department of Labor, American Standards Association and insurance company safety engineers.

3. The third item that this analysis reveals to me is a lack of a proper evaluation of the problem in individual plants.



Note the large number of accident causes under the heading of *guarding* and the large number of accidents listed under *press deficiencies*.

I wonder how many people actually evaluate their punch press problem with the idea in mind of really getting to the base of the problem? I know from experience that all too many plants never properly analyze their press room safety problems. Many plants guard secondary dies but do nothing in regard to primary operation dies, others provide a few universal type press guards that have been bought as a result of some one serious accident but cannot be used on many operations because of the type of die design, still others do a fair job at punch press guarding but actually let the presses deteriorate for want of a maintenance program.

In order to establish a well-balanced program, certain basic principles must be considered.

One must consider the safeguarding problem in a small press room with a foreman die setter and a few operators involved is such that a simple program can be developed. This program will consist of the guarding of a few dies and provision of press guarding facilities supplemented by the personal supervision of the foreman die setter over safe practices.

Where twenty or more presses are involved, the press room may be divided into separate departments under various supervisors. The die setting operation may be sub-divided among various individuals with the result that split responsibility exists. Therefore, a workable program would consist of the development of company standards that must be adhered to by all who enter into the problem. This would include the supervisors and employees of the plant planning, die design, maintenance and electrical departments. These standards should consist of a statement of company policy as to the use of existing guards, provision of protection for unguarded operations, the consideration of the safety factor in new operations, enforcement of safe operating specifications, etc.

The type and make of presses must be considered. Small positive clutch machines present a problem in guarding the die or providing a press guard. The larger draw presses or friction drive machines are much different in design and the more common type guards are the constant pressure two-hand trips, pull-back guards, etc.

The number of dies involved is a major factor in determining the extent of the point of operation guarding program. The *number of active dies and the number of* dies in dead storage should be inventoried.

*If this inventory shows a large number* of active dies and a dead storage supply of many more dies, consideration should be given the provision of die guards and feeds on those dies used for high production operations, as the first step toward safeguarding the dies most often in use. Adjustable press barriers should be used for the dies used for short run operations or where it is impracticable to guard these dies. Press guards should be installed for use on operations in which feeds are not provided, and barriers cannot be used.

Should this inventory reveal the fact that a job-shop condition exists in which the runs are short and many die changes are made, or the dies are the property of other manufacturers, it is advisable to consider the installation of press guards on each machine for use on a secondary operation. An adjustable press barrier should also be installed on each press for use on blanking, shearing, corner-cutting, etc.

An analysis of the operations is necessary to determine the extent of the variance in type of point of operation hazards. This analysis should enable you to group operations according to primary, secondary or miscellaneous operations.

The primary operations include blanking, piercing, parting, corner-cutting, progressive dies, simple compound dies, etc. Such operations are usually manually fed to the press, but at times, a roll or hitch feed may be used.

The operator is not required to place his hands in the danger zone, so a die guard or press barrier will not interfere with his movements.

The provision of an individual die guard on each die in this category would be ideal. However, it is generally a long-range proposition and pending the completion of such

a program, it would be advisable to provide the dies used for heavy production operations with die guards and provide adjustable press barriers for those dies used infrequently or for short runs.

The secondary operations include bending, forming, embossing, coining and pressing or other operations whereby a blanked unit is further processed. All dies where it is necessary for the operatur to place his hands in the danger zone to nest a piece in the die manually should be included in this category.

When many parts are processed on one die, it is usually economically practicable to provide a feeding device which eliminates the necessity for the operator to place his hands in between the dies. After a feeding device has been provided, a barrier guard should be installed to prevent the operator from reaching around the feeding device. A feeding device does not constitute full protection. It eliminates the necessity for the operator to place his hands between the dies and allows the installation of a barrier guard.

You will find miscellaneous operations which include riveting, assembling, burnishing or sizing dies, straightening or flattening dies, marking and numbering dies, crimping dies, etc. Due to the lack of other equipment, these operations are performed on a punch press.

These are specialized operations and normally found being operated on small run production for special jobs. Operations of this type are usually in the secondary operations class and can be best guarded by the use of one of the various types of two-hand controls, gate guards, pull-back guards, etc.

There are occasions, however, where some changes in die design provide a safe operation by the use of simple feeding applications. An example of this is the use of a slide for a riveting operation. The parts to be riveted are placed on the slide and the slide is then pushed to a position under the punch.

One must consider the production rates. Special consideration should be given to all dies used for long run production. Dies of this type are usually such that various types of feeding applications will prove practical. In such instances, the jobs can carry the expense of guarding and tailor-made guards can be provided. The guard should consist of a barrier permanently attached to the die or die shoe and remain a part of the die at all times. At times it is necessary to provide a feeding application in order to be able to use a die guard should the die be in the secondary operation category. These feeding applications often speed up the operations to the extent that they are well worth the time and money spent.

Dies that are used for short run production or dies that may be the property of other manufacturers often cann . be provided with die guards. Feeding applications are often economically impractical and changes in the design of the die are not possible.

Punch press operations of this type are the most difficult to guard effectively. The safeguarding of the operators under these conditions should be considered as an overhead expense and guards provided as permanent press fixtures that can be used on the majority of jobs found to be in operation.

In this respect, an adjustable press barrier should be provided on each press for primary operations. A gate guard, two-hand trip, pull-back, sweep guard, etc., should be available on each press for secondary operations.

I want to leave one thought with you that has a bearing on the large number of accidents that show up in this analysis as a result of maintenance problems. By keeping in mind the basic principle of punch press guarding which is to eliminate as much as possible "under-the-punch" feeding through the use of automatic or semi-automatic feeding devices and the installation of the most effective type of punch press guard which is a barrier enclosure, accidents resulting from an accidental tripping of the press can be minimized. In other words, if your guarding program considers the fact that accidental tripping of the press is a possibility and you guard against it by providing the facilities for the operator to feed the press without his hand being in the danger zone, actual accidents caused by mechanical failure will be eliminated.



# Faulty Maintenance and Inspection as Injury Cause

By F. D. MUMFORD
Service Manager, E. W. Bliss Co., Toledo, Ohio

We all have a great deal of statistical information showing the reported records of several hundred differently classified accidents. Upon study they break themselves down roughly into two general classes, the first of which is bad personal practices, for which we know the human element is the cause, and the second includes improper guarding, lack of guarding, improper maintenance, lack of maintenance, etc., which, when traced back to its cause also involves the human element for permitting these known conditions to exist.

Next, we tried to arrive at some general recommendations to pass on to this group. It was agreed that there are no suitable recommendations governing the mechanical or physical side of lack of maintenance and inspection which would be equally applicable to the varied industries in which power press equipment is used.

However, there is one point of unanimous agreement: that management planning for proper maintenance and inspection will not in itself obtain the desired result. It must be through the energies of all individuals connected with the problem that the proper effort be directed to the solution of the problem.

Let's go back a bit and examine some too common and yet very significant records of faulty maintenance and inspection, which result in lack of safety. We will find roughly 20 per cent of the accumulated claims involve defective machinery; another 10 to 15 per cent concern unguarded machinery; another 10 to 15 per cent involve improperly or inadequately guarded machinery, etc. All these are the result of the human element which permitted these conditions to exist.

Why is it that we do not instinctively recognize such dangers as greasy floors, electrical shocks, asphyxiation etc., much as a child knows the hazards of ice a hot stove or any unpleasant odor?

If we as citizens were more intelligent on detection, inspection, maintenance, and safety, there would be more contributions to safety, and this should be a major consideration for educational and safety personnel and for maintenance and inspection personnel.

Where we find the emphasis to depend upon maintenance, inspection and physical safety devices, there we find the greatest errors, and conversely, where we find the emphasis based upon the human element, we find our greatest safety.

The majority of the most accurate ways of inspection and maintenance, resulting in good safety, have come from those directly at the level of the problem, whether it be operating a power press, or any other normal endeavor, even though they were perhaps the least articulate.

However, the best of us if not allowed to share, to give voice, or to be recognized for our endeavors in matters, will, when frustrated, display an abusive disposition or make excessive demands.

A machine cannot always be assumed to be in proper condition unless its latest records of inspection and maintenance, which should include the opinion of the operator, show that no further improvement is called for.

Too frequently, this speaker has passed through plants where operators were working machines with guards which they had deliberately made inoperative, permitting them to use bad personal practices.

When such things are done, it follows that the men do not always report conditions needing maintenance or safeguarding, and by the same token, this speaker has seen many cases where operators have noticed and reported conditions requiring immediate maintenance and were told that production could not be interrupted at that time. This point is brought out to illustrate that where men are denied this recognition and protection, they resort to practices not conducive of safety.

It is the problem of those in inspection, maintenance and safety work not only to become more and more qualified, but to

be able to teach those who operate the machines to be contributors and protectors of themselves and others and the machines upon which they depend. For it is clear that if we do not develop the individual constructive energies, we will have outside regulation to attempt the reduction of our national injury figures.

## Specific Training of Set-up Men

By EDWARD G. HOLTZMAN
Head of Safety and Medical Depts., Industrial Relations Division, Wagner Electric Corp., St. Louis, Mo.

The definition of a "power press set-up man" or "die setter" according to the *Dictionary of Occupational Titles* published by the United States Department of Labor is one who "sets up dies in power presses and adjusts them to normal operation: removes used dies from machine by unscrewing bolts and cleans scale or dirt from bed with a brush; selects proper dies and lifts them to machine by hand or hoist; bolts (male) die to movable block and lowers (female) die in approximate center of bed or anvil of machine using wrenches; lowers male die to a point just above the female die and adjusts the latter until the raised impression on the male fits exactly in the corresponding depression in the female; clamps female die in place by tightening nuts and adjusts length of stroke of male die; operates machine to try a few pieces, inspects them, makes adjustments, and turns over machine to operator."

The duties of set-up men will vary depending upon the particular locality. In some small shops the operator does all his own set-up work. For the purpose of this discussion we will limit the set-up man to a more concise and less controversial general job description.

Let us say he is one who removes and inserts dies into various sizes of punch presses, sets ram, levels up die, runs first pieces and has pieces checked by inspection department, arranges work place and assigns operator to the job, instructs operator in proper method of operation.

Our job rating gives the following requirements:

| | |
|---|---|
| *Education:* | Read, write, count, some blueprint reading. |
| *Experience:* | Nine months to one year to learn almost all the large dies. |
| *Initiative & Ingenuity:* | Must locate dies, set up machines, make some decisions and use good judgment on some work requiring standard methods and procedure. Little planning required. |
| *Physical Demand:* | Considerable physical effort required in handling heavy dies. |
| *Mental or Visual Demand:* | Continuous mental or visual attention required through most of operation. |
| *Responsibility for Equipment or Presses:* | Could crack or damage large expensive dies. |
| *Responsibility for Material or Product:* | Little responsibility; pieces are checked by inspection before run is made. |
| *Responsibility for Work of Others:* | Usually acts as a leader in assigning operator to work. |
| *Responsibility for Safety of Others:* | Improper instructions or set-ups could cause serious injury to operator. |
| *Working Conditions:* | Continuous noise and greasy work. |
| *Hazards:* | Loss of hands, fingers, possible hernias, etc. |

This description can be varied, of course, according to the type of punch presses you have in operation. However with this background of the requirements of a set-up man we can now begin consideration of his training.

There are only two ways I see that a set-up man can be obtained. He is either recruited from outside your plant or from operators within your plant. We, like most organizations, have always attempted to upgrade our workers from within the ranks. It becomes readily apparent then that your training of a set-up man under this system begins with the operator. Although this phase of the subject will be covered by the next speaker, I would like to elaborate briefly because the two can not be separated.

Indoctrination of safety principles in the operators is a must for his early training is the foundation for the later skillful operation of setting up.

Assuming that the operator has been properly trained and is chosen for a set-up job because he has the necessary qualifications already enumerated, he then is ready for specific training. What methods can be used?

1. Visual Education
2. Working with or along side another set-up man

We will first take education by visual means. Visual training is recognized throughout industry as the most effective means of teaching any subject. During the war the Army, the Navy, the Air Corps, in fact all branches of the armed services experimented with visual education. They found out that trainees learned as much as 55 per cent faster and remembered up to 70 per cent more and longer when visual education is used to help teach. The National Safety Council is a great exponent of visual education. It would therefore seem that if any training of set-up men is to be instituted in your plant you should seriously consider visual means. What are the various methods of visual education?

*Motion picture films*—For the larger firms it is not unusual to develop a motion picture film on a specialized subject. There is no question but what this is the most desirable, but many of this group represent smaller firms whose safety or training department budget will not allow fancy sums to develop motion pictures.

*Sound slide films*—Sound slide films are very much within reasonable to make and many of you use sound slide films exclusively in your safety program. You can take the desired pictures and then have the sound synchronized to the film on a record.

*Slides*—Slides that can be used in a projector are a splendid method of developing a reasonable and effective training program. This is far less expensive. Slides can be produced for as little as 90 cents each. They are valuable in that a group or conference leader can dwell at length on a particular phase of the slide.

*Charts*—The last type is the chart or enlarged drawing method similar to the safetygraphs produced by the National Safety Council which is currently so popular in industry. This is by far the most economical method and any size plant can adopt this with minimum expense. We consider Safetygraph No. 3, "Operating Power Presses" a very important part of our training program. We not only present this safetygraph to our new punch press operators but repeat it in our training of set-up men.

*Booklet or manual*—Another type of visual education is the booklet or training manual. George Greenwood, Safety Director of the Western Electric Corporation, gave me a copy of their punch press training text. It is the most complete that I have ever seen. It contains 117 pages of punch press data concerning every phase of set-up as well as operation. I am told that it is the outstanding text of its type. The thoroughness with which this manual is written is an inspiration to safety engineers. This in part accounts for Western Electric's splendid safety record.

On-the-job training is probably used far more extensively in small and medium size plants because it is born of necessity but if this on-the-job training could be supplemented with visual means it would be another step towards rounding out a successful training program. On-the-job training consists of single short work periods on which the operator works directly with and under the supervision of the set-up man. It is at this point that the set-up man who has learned his lessons well can inculcate them into the operator who is being groomed for the set-up man.

All too often we have witnessed a set-up man instructing an operator on set-up procedure and concluding a particular phase of the work with this remark, "Now this is dangerous, don't get hurt." It is this generalized teaching that we in the accident prevention field desire to break away from.

Safety in setting-up is an integral part of the operation and should never be left hanging like the tail on a dog for the set-

up man to say, "Now be careful, don't get hurt." Even though the experienced set-up man has been properly trained it is too much to expect of him to be able to teach another for that is a separate and distinct subject. The operator who is the contemplated set-up man should receive intensive visual education along with on-the-job training. This is an ideal situation.

Since it is generally recognized throughout safety circles that punch press departments are more hazardous than most other operations, a sound training program for your set-up men is not only essential but an absolute must. There are many safety devices and guards to prevent punch press accidents. We at the Wagner Electric Corporation use in our punch press department what is known as the Possen Positive Safety Device with which many of you are familiar; the principle being that the device is connected to the ram so that when the ram descends the operator's hands which are connected to cables will be pulled out of the point of operation.

Sometime ago one of our set-up men was attempting to gauge the amount of slack in the cable that would permit safe operation by one of our women operators. In measuring the safe margin of pull back the set-up man miscalculated and the girl's hand was not moved from the point of operation in time. The result—amputation of four fingers of the right hand. I make this statement not because I think the Possens Device is not good; on the contrary, if operated properly it is one of the finest types of device that can be used.

We all know that two handed trips whether actuated by air or electricity have all at sometime or another failed and have caused serious injury. The point I make is this: As long as man has some part in setting these devices there will be a margin of error.

After that gruesome injury we developed simulated hands made of wood and all of our jobs are set up with these wooden hands connected to the cables before any operator is permitted on the machine. With the exception of that one accident our experience has been extremely favorable because we have trained our set-up men extensively in adjusting and setting up of this device. In fact, Wagner Electric Corporation won 1st place in Heavy Machinery Section of the 1947-1948 Metals Contest. Frequency 1.86.

Once again let me emphasize that there is no perfect guard against injury while the human factor is involved whether it be on the operator or set-up man's part. Therefore the training of the human factor is all important for without this training your punch press department is subjected to the many types of gruesome amputations that all of you are already too familiar with.

Let us remember this: It cost less to do the job the safe way. Today when insurance premiums, workmen's compensation, surgical fees, hospitalization and all the other many items connected with an injury are on the up-grade, it is necessary now more than ever to cut accidents in your punch press department because your competitor is doing it and if you don't, top management will be asking you, the safety director, "Why?"

There is no short cut to safety. Like any other desirable thing you've got to work for it. Your management can be sold on specific training of punch press set-up men if you show them they will get something in return. The records of those firms using training programs should be all the ammunition you need. General Motors, Ford Motor Co., Chrysler, Western Electric, General Electric, Westinghouse, and many firms too numerous to mention have cut the severity of punch press accidents because they instituted intelligent training programs. There is no mystery, no secret to their success. It is yours for the asking.

# Specific Training of Punch Press Operator

By JOSEPH F BARTUSEK

**Chief, Plant Trades, Shop Operations & Cooperative College Training Section, Western Electric Co., Inc., Chicago**

I'd like you to imagine yourself in any one of the many shops throughout the country engaged in punch press work. Suddenly above the constant rythmic sound of the bumping of the punch presses a cry is heard, and another operator is destined to go



through life marked with the unmistakeable trademark of his occupation. This, no doubt, has occurred at sometime or other wherever press operations are performed. It is obvious then that punch press accidents can be and are severe.

It has been pointed out that injuries to personnel working on or around presses are caused, basically by unsafe acts, unsafe preventable conditions, or a combination of both. Statistics, such as the analysis found in *Accident Facts*, not only provide detailed information about the hazards encountered in punch press work but also serve as a guide in setting up preventive measures to control these accidents by gradually eliminating their causes.

For each of these unsafe acts there is in counterpart—a correct, safe way of doing the job. Adherence to these safe correct methods prevents accidents. But the trick is getting the operators, setup men and supervisors to accept and willingly adhere to these methods—think them and make them part of their "way of life." In our company we have found that background training designed to give a better fundamental understanding among other factors contributes heavily to this end. The question naturally arises, how can training be set up to make this contribution?

In discussing this question I am concerned not so much with the actual on-the-job training of an operator by his supervisor, setup man or key operator as with the contribution the Training Department can make in increasing the knowledge of the "Why" aspect. In other words, of making logical and reasonable our insistence on the specific "How" to do the job correctly and to gain willing acceptance of the prescribed methods.

First and foremost every training course or program should be built around the safety objective—namely, to bring about an understanding of safety fundamentals and of the specific safe operating practices for the machine involved.

Second, another objective should be to bring about a better understanding of the machines, tools and processes involved, together with the operating characteristics necessary to deliver a good product. In other words, increasing efficiency on the job.

Third, the training should also be set up to bring about a better understanding of how to maintain the equipment at optimum efficiency. This entails an understanding of expected machine and tool life between overhauls, the effect of improper setups and the hazards and false economies of stretching runs out beyond normal tool life.

Fourth, we never overlook the human relationship angle. Operators, setup men, supervisors, engineers and incentive rate setters all attend our classes and often together. This means that in the end each understands the terminology or language involved, the other fellows' problems and point of view, particularly so far as safety is concerned and they all appreciate why certain procedures must be followed in certain situations.

Now let us take a look at how we go about achieving these objectives in setting up a course. In the first place, we would assign the problem to an instructor chosen because of his experience with punch press work either as an engineer, a builder of these machines and tools, or a setup man in this field of work. He would naturally first set down from his own job knowledge the information he feels should be imparted, roughly grouping it in a logical sequence of the main and sub topics involved. Under each one of these headings he would outline what he thought should be included using available information such as the hazards analysis information, manufacturing standards, manufacturers' catalogs, drawings and reference texts. As an example of the ground covered let us refer to those main headings and mention briefly the points to be covered under each.

1. *Types of punch presses and auxiliary press equipment used.* A general description and explanation should be given regarding the variations in press construction, kinds of action and capacities of each. Reference to name, function and, if necessary, the adjustment of each part of the punch press should also be included. The purpose of the various kinds of auxiliary equipment required in connection with the operation of a press should be explained and discussed.

2. *Different operations performed.* The various operations performed on each type of press should be explained and discussed with the aid of sample parts and shop observation.

3. *Types of tools, their setup and opera-*

*tion.* The tools used should be described and their functioning explained. Proper care and maintenance should be brought out with emphasis placed on the value of tools. The correct procedure for setting up different types of tools stressing effect on tool life, product quality and safety, should be discussed together with their operating techniques. Guarding and use of proper handling implements should not be overlooked.

4. *Materials used in punch press work.* The characteristics of the different materials worked on and their effect on efficient and safe operation should be taken up. This includes a general description of the materials, their properties and how they may be identified. The influence different kinds of material have on the type and construction of tool used should be pointed out to emphasize the reasons for die clearance, die thickness, etc.

5. *General manufacturing information.* The operator should be acquainted with the methods used for getting information and directions to the shop. On the basis of the particular shop's practices, he should be able to interpret the information found on job tickets, manufacturing layouts and blueprints. He should know how to refer to available standards and in general be alerted to point out errors if they exist.

6. *Good housekeeping and safety.* The need for providing a place for everything and keeping everything in its place for efficient and safe shop conditions should be discussed. Safe press operating practices and the use of proper protective equipment should be stressed. It must be remembered, however, that safety should be integrated into proper job instruction to achieve its purpose and not left hanging by itself in mid-air as a separate entity.

Different points would be emphasized somewhat more heavily than others, depending upon their relative importance to the operator in the particular shop for which the training is done. Next, the instructor would take his listing of these ideas, in outline form, and discuss them with other qualified operating and setup people, supervisors, engineers and staff people, such as safety and rate setting people. Based on the fund of information thereby obtained, he would once again revise his outline and then submit it formally for a test run of a few classes in which representative people from the various organizations requiring training were present. Naturally the program entails an orderly presentation of first things first and an objective in terms of time in which to cover the ground outlined. With the resultant final changes, and such further modifications as may seem advisable from time to time, the course is then given to the various operating and staff personnel who need to acquire the information.

Our punch press course entails 32 hours of classroom discussion. To date it has been given to approximately 500 employees about one-third of whom were setup men, supervisory or staff employees.

With an outline and rough notes, catalog pages, etc., as a starter, we have polished up the material into a reference text. This text is used in the classes and for reference on the job. It is also used at other Western Electric plants as well as at Hawthorne, for we have a system of exchanging training course material between works to avoid duplication of effort.

Right here I can hear some of you saying, "That's all very well but how about results." As you all know, evaluating results of training of personnel work of any kind is a ticklish problem. The truth is that everybody has a hand in plant improvements so why waste time arguing about how to split up the pie!

However, from our experience we can conclude that the training has resulted in:

1. Better and more frequent checking of the runs by the operators preventing tool breakage, defective output, and hazard to employees and machines.

2. Better analysis by setup men and supervisors of operational difficulties and determination of proper remedial action.

3. The greater use of improved intelligent, operating practice to increase output and the consequent reduction of foolish chance-taking to beat the rate.

4. Better planning for machine and tool overhaul with less production loss from unexpected shutdown.

5. Engineers, supervisors and employees understand each other and their respective problems better. They all speak the same language as to standards, operating terms, etc. Rate setters are better informed in the matter of including all operations in their rates that are necessary to safety, machine and tool life.

6. Employees are better oriented to their job, derive more satisfaction and interest from their job and understand its importance in the overall objectives of the Company.





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## THE PRINTING & PUBLISHING SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Printing and Publishing Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Printing and Publishing Section carries on in behalf of its members, and for the benefit of accident prevention work in the printing and publishing industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of printing and publishing plants. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on page 23 of this volume.

# Safety in the Government Printing Office

By W. A. ANDERSON
Chairman, Executive Safety Committee, Government Printing Office, Washington, D. C.

In presenting the safety program of the Government Printing Office, it is well to first take a look at the safety organization. Basically, the supervisors are responsible for the safety of the employees in their section. The supervisor is assisted by the following safety organization: executive safety committee, housekeeping and accident investigation sub-committee, safety officer, and employee safety representative. A doctor and a staff of nurses render first aid and emergency treatment to employees injured in the line of duty. There is a well equipped first aid room, x-ray facilities, and equipment for giving therapeutic treatments.

The executive safety committee reporting to the public printer through channels is responsible for the promotion, organization, and administration of the Government Printing Office safety program. This policy making committee represents a cross section of the office and is made up of the mechanical superintendent as chairman representing the maintenance division; the production manager, the production division; the comptroller, the administrative divisions; the field service manager, the field plants; and the medical director, the personnel division. When formulating policy, there is assurance of office wide cooperation as all divisions are represented and in agreement on the programs adopted for the office. The safety officer acting in a staff position is secretary to the executive safety committee and the sub-committee, and serves in an advisory capacity in the fulfillment of our safety program.

Other functions of the executive safety committee are to project future plans for the advancement of safety and housekeeping programs, to publicize the program, and arouse and maintain worker interest in safety, establish standards for guarding machinery, promote safe operating practices and procedures, study and analyze accident records, and prescribe action to be taken to reduce the number of accidents. The executive safety committee meets regularly each month to analyze the previous month's safety record and to formulate policy.

The sub-committee known as the safety and housekeeping sub-committee, functioning under the direction of the executive safety committee, is responsible for good housekeeping, the investigation of accidents, and the enforcement of safety rules and regulations. This sub-committee is also responsible for the assignment and supervision of monitors to maintain order in their respective sections during the lunch periods, closing hour, and in case of emergency. Monitors are authorized to enforce all safety regulations in their assigned areas regardless of whether or not the employee concerned is under the supervision of that section. Crowding, running, and overloading elevators are typical unsafe practices the monitors try to correct. In cases of repeated unsafe acts, the monitors recommend corrective action to the supervisors.

The safety officer, together with an employee representative elected by the employees in each section, comprise our shop safety committees. The shop safety committees make physical inspection of their respective sections to spot and list unsafe conditions and unsafe work practices, and suggest corrective action to the foreman. Where the foreman does not have authority to act on recommended corrective action, such action is recommended to the next higher level of management.

To contribute the viewpoint and practical knowledge of the workers to the safety program, the safety representative accepts safety suggestions from employees in the section and submits these to the foreman for consideration and action. The safety representative is responsible for the proper maintenance and posting of safety bulletins, safety posters, and such safety material as may be promulgated from time to time for the information of the employees by the executive safety committee.

The safety representative maintains a bulletin in his section showing the number of days worked without a lost time accident. Separate records are kept on each shift in each section. This is a form of safety contest, and in some divisions considerable

rivalry exists between the day shift and the night shift and the various sections within the divisions. Each month the figures are verified by the safety officer for accuracy.

Safety bulletins are issued from time to time to employee safety representatives and all supervisors to keep them informed of the action and policy of the executive safety committee and of new safety rules and regulations. The safety bulletin is used as a means of communication between management and the employees.

The safety officer, in addition to acting as secretary of the executive safety committee and the sub-committee on housekeeping and accident investigation, maintains, compiles, and analyzes safety records and statistics.

Safety posters are displayed throughout the plant on special safety bulletin boards using commercial posters and posters of our own make to call attention to hazards peculiar to our plant. These posters also serve to publicize the safety program.

Accidents are the result of either unsafe conditions or unsafe acts. Very often accident investigation reports indicate that a personal factor was a contributing cause. In many cases it is possible that what was reported as an unsafe act was the result of fatigue, either physical, mental, or visual. The employee may be doing work manually that can just as well be done mechanically. He may be subject to fatigue and distracting noises, or he may be working under poor lighting conditions so that he suffers from eye fatigue. Fatigue results in a reduction of physical and mental alertness that leaves the employee a potential accident victim.

To reduce eye fatigue, fatigue from noise, and provide healthy working conditions, a program was launched about a year ago of improving working environment. This program is now well under way and today about 50 per cent of the employees enjoy the advantage of working in quieter, better lighted, and better ventilated workrooms. Another result of improved working conditions is better housekeeping which in itself is one of the basic requirements of a good safety program.

The employee's attitude is an important factor to be considered when striving to improve the safety record. The employees working in a dreary, drab, and dirty workroom seem to reflect the sordid conditions under which they work. The worker in a well lighted, well ventilated, and reasonably quiet workroom presents a more cheerful and alert frame of mind which is conducive to increased safety and productivity.

Where operations which tend to contaminate the air with lead, paper dust, and toxic fumes are performed, special exhaust systems have been provided. In the stereotype section it was found that air contamination was possible from the plate cutting saws and shaving machines, so a special dust collecting system was installed. The lead dust and fine chips are salvaged for reuse which helps repay the expense of the equipment. Plans call for providing air conditioning in all workrooms in the near future where the heat load is not too great to prove air conditioning impractical.

Lighting has been improved in quantity and quality. Formerly, the general illumination provided from seven to ten foot-candles of light from an incandescent light source which created considerable glare and high brightness ratio between the lights and the dark surroundings, machinery and equipment. Now from 40 to 65 foot-candles of light are provided at the working plane in the various workrooms, depending on the visual task and the degree of hazard involved in the operation.

Glare has been reduced by shielding the fluorescent light sources with louvers. The brightness ratio has been reduced within limits for comfortable seeing conditions by painting ceilings white, side walls and trim in colors with a reflection factor of about 70 per cent, and painting machinery and equipment a light gray. Good lighting is also important so that employees operating high speed machines can see at a flash when something goes wrong.

We are using colors functionally to the best of our ability. A light bluish green is used where a soothing, easy on the eye color is wanted. A deeper shade of the same color is used for trim. Where there is a large heat load in the area, the coolest colors, namely blue is used. To provide a little stimulation in the workrooms cut off from outside light, a yellow with a deep blue trim is used.

It is claimed that colors have a psychological and physiological effect on human beings. We haven't attempted to determine what it is, but believe it is good logic to take advantage of the effect of color when repainting. Since we have been using colors functionally, employees have noticed that the workroom appears to be larger with more space around machines, and they don't feel the former effect that overhead ducts and piping are encroaching on their work space.

All ceilings are painted white. Side walls are painted white down to a line just below the lowest ducts, pipes, or lighting fixtures. In that way the overhead surfaces are lost in the ceiling, and the lighting fixtures do not stand out in contrast with the side wall color.

The noise level in workrooms has been reduced about 40 per cent by the installation of acoustical tile ceilings. In the bindery the old plastered ceilings were removed and replaced with acoustical tile. The constant mental hazard of falling plaster was eliminated and a quieter working condition provided. A perforated type tile which can be painted without impairing its acoustical qualities was installed.

We believe we will have fewer accidents by making these improvements because the workrooms are kept cleaner, eye fatigue and fatigue from noise have been reduced, and healthier air conditions prevail. We also believe it is economically sound to provide good working conditions, not only because of fewer interruptions to production from a reduction in accidents; but it is reasonable to expect that an employee can produce more and better work when working in good environment.

We are always searching for ways of reducing physical fatigue by the use of mechanical handling equipment. One of the most recent installations is that of three mechanical elevating devices for raising skid loads of work to the proper height for transferring work to the machines. This eliminates stooping to pick up bundles of paper which becomes a backbreaking job. At present elevators are electrically operated and maintain the top of the paper at a given height by means of an electric eye. A new hydraulic elevator which will accomplish the same results is soon to be installed.

Guarding of machinery is an important phase of the safety program. Many guards are placed on machines as a result of accident investigations. We have gone a step further by making periodic surveys of all machinery to determine if additional safeguards can be effectively used without interfering with the operation of each machine.



Apprentices are indoctrinated in the advantages of safe, clean, healthy work conditions and safe working habits through a series of lectures. These lectures are delivered by the safety officer and stress the importance of all phases of our safety program and employee participation.

Supervisors are trained and kept informed on safety matters through the safety bulletins and conferences. All supervisors have completed a series of ten slide film conferences dealing with the important phases of safety.

Each new employee is given a form explaining the benefits by the Employee Compensation Commission which instructs the employee to report every injury, no matter how trivial, to the employee's supervisor. The new employee is also given a copy of a pamphlet entitled "Digest of Rules and Regulations" which contains instructions on safety and fire prevention.

Operations include about 90 industrial electric trucks which are a potential hazard. Drivers are trained in the safe operation of these trucks, and are only assigned after successfully completing the driver's training course. Only authorized drivers who are issued driver permits are permitted to operate electric trucks. Drivers are not permitted to carry passengers on electric trucks. These employees are under the supervision of the foreman in the section where they are working as they operate trucks away from the jurisdiction of their regular assigned supervisors.

All applicants for driver positions for the fleet of 37 street trucks are given a driving test and must qualify as safe drivers before they are appointed.

To insure efficient and safe placement of equipment and machinery, ¼ inch scale models are used in making layouts. By the use of models, management can visualize, without depending on the imagination, exactly how the workrooms will look, and whether adequate aisles and working space have been provided for safe operation.

Cash awards are offered for worthwhile safety suggestions submitted by the employees and adopted for use. In this way

employee interest is stimulated in the safety program, and give the employees a voice in management. Since the benefits to be derived from safety suggestions are intangible but present potential savings, awards are based on the number of employees affected by the suggestion, with a minimum of $10. Lost time accidents are costly, involving medical treatment and compensation costs, but the greatest loss to an industrial plant is lost production time.

The object of the safety program is to protect personnel and property. All accidents do not involve personal injury, some may only involve property damage. To gain the greatest benefits from a safety program, all accidents must be reported and investigated wherever personal injury or property damage is involved.

The main objective, of course, is to safeguard employees against exposure to hazards as far as practical.

The reporting and recording of accidents is important so that analyses and comparisons can be made to measure the progress of the safety program. All injury reports are reviewed by the safety officer. All lost time injuries are investigated and corrective action recommended to the operating personnel by the safety officer or the housekeeping and accident investigating sub-committee. At the monthly meetings, all lost time accident reports and corrective action recommendations are reviewed by the executive safety committee.

In conclusion, we can point to a downward trend in our frequency of lost time accidents and minor injuries. Our average frequency this year through September is less than last year's record. Our severity rate is about the same which is largely attributed to increased wage rates which increase our compensation costs. We have during the year broken a record in the office by working 559,400 man-hours without a lost time accident. An active safety program renders a real service to the American workers by promoting better and safer working conditions thus reducing their exposure to hazards.

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# Hazards Peculiar to the Printing and Publishing Industry

By RALPH M. KRAMER
Supervising Engineer, Employers Mutual Liability Insurance Company of Wisconsin, Chicago

Many years ago the printing and publishing industry was considered hazardous from the standpoint of unguarded equipment as well as being dangerous to health. Today much has been accomplished in guarding machinery and many of the health hazards have been eliminated through plant layout and construction. But there is still much to be desired in both the large and small plants. The greatest concentration is probably necessary in the small plant.

The United States Department of Labor figured that in 1947 the total accidents cost to both management and labor, in all industries, was three and three quarter billion dollars. Wage losses alone amounted to one and one half billion dollars, enough to feed, clothe, and shelter a city almost as large as Detroit for one year. One American is injured every 16 seconds of a 24 hour working day. One worker is killed or permanently crippled every four minutes. Small firms not reached by organized safety movements accounted for 70 per cent of all accidents. This bears out the fact that small plants in all industries, as well as the printing and publishing industry, are in need of an organized safety program.

The time allotted me will permit only a brief discussion of some of the most common hazards to the printing and publishing industry.

Let us first consider the loading platform at railroad side tracks. If a steel plate is used between the loading platform and the railroad car the plate should be anchored or have steel angles welded on the underside so spaced that the plate cannot slip from the car or platform.



Either hand or power trucks are used in the loading or unloading process. Broken or slivered hand truck handles cause many accidents of a type which can result in infections. The open operator end of power trucks have caused serious injuries such as broken ankles and broken legs. I can recall three such injuries this past summer. In all cases the recommendation was made and carried out to enclose one side and the back of the truck with heavy steel plate. This will eliminate the chance for the operator to put his feet over the back edge of the truck and crush them against a stock pile, building pillar, or the wall. Also by guarding the back of the truck, we make the operator enter from the side. This is a good recommendation for power trucks regardless of where they are used.

This brings up the problem of roll stacking. Whether you stack two or four tiers high makes little difference, as long as all warehouse employees are properly instructed on wedge blocking. We know that when the front roll slides out the rest will follow, so it would seem important to block each roll. Somewhere in the process of stacking the employee comes in contact with the roll being stacked and one that has been stacked. It is in this operation that we have many crushing injuries.

Certainly the greatest amount of care must be exercised in the handling and stacking of rolls. Some concerns have begun to stack rolls on end. This seems a much safer method, since the top rolls can be taken out anywhere along the line without disturbing the other rolls. A special type of truck, of course, is necessary to handle rolls stacked in this fashion.

Machine hazards contribute their share to the industry accident record. Whether it be a small press or a larger newspaper press, the hazards are many. Years ago a pressman had to work in close proximity to gears, shafting, cams and other dangerous moving parts. Today the manufacturers have done a clever job of guarding these moving parts.

We must, however, still check to see that the necessary platforms are provided with rail guards and that a stationary ladder or stairway has been provided to the platforms. It is not uncommon to have hernia cases reported as a result of jumping up or down. All drive belts and pulleys should be completely enclosed. Balance wheels should be blanked out to eliminate the spoke hazard. Due to the large number of rollers involved in the larger presses the operator is continually confronted with nip hazards. Each should be studied to see if it can be guarded. Care must be exercised in threading or cleaning up the press. Inching buttons should be used for the purpose for which they were intended and not have an assistant ride the inching button to speed the work along.

While accidents on hand feed platen presses are not numerous they are most generally of a serious nature. Guards can be installed which will remove the hands as the jaws of the press close. Many of these guards are in use and are effective.

I believe our old friend, the guillotine paper cutter, is a problem and a severe hazard in every plant. It is comparatively simple to provide a two handed trip of some sort on this machine.

You are given many excuses by operators as to why this device is unnecessary. One of the main reasons they give is that they must hold the paper, yet I have seen wood blocks and wood T square arrangements used very effectively.

Eye injuries contribute their bit to the accident record. The greatest eye hazard is the metal saw and the router. Guards and shields will eliminate flying particles from the saw. If more than one router is used, a screen partition should be placed between routers, and if possible the routing area should be physically separated from the other operations. This is advisable so that you do not expose other departments to the flying particles. The operator should be provided with goggles while performing this job.

Gathering machines produce but few accidents, possibly because of the automatic nature of the work, yet there have been some accidents of a serious nature. One gathering machine I know of, had a good sized wheel partially exposed. The link belt traveled over this wheel at a moderate speed, but as a result of the exposure a young man lost a part of an arm in 1946.

Brooming is probably not generally recognized as an explosion hazard. A few years ago a plant here in Chicago had an explosion as a result of using aluminum bronze dust. It caused the death of the operator. Ventilation and good housekeeping are essential to control the dust, thus cutting down

the exposure and resulting in safe operations. It is, of course, also necessary to eliminate any source of ignition.

In various departments throughout the industry it is necessary to use acids of different sorts. Acid burns can cause considerable trouble and especially so in eye cases. The proper protective clothing is essential, such as rubber cup goggles when handling the acid and rubber gloves and aprons to avoid contact with the skin when handling material in acid solution.

Handling materials has proven a source of many injuries to hands and toes. In a few isolated spots conveyors can be used. For the greater part it is necessary to stack materials on skids and platforms to move them about the plant. Many toe injuries are the result of trucks running over the toes or in the handling of platforms. Safety shoes may be partially the answer.

Much can be done in the training of workmen in the proper method of removing or stacking platforms. One of our good friends is putting considerable effort into educating employees in the safe handling of platforms. Instead of just dropping the platforms on end they are instructing their employees to bring the platform down so it contacts the floor on the corner of the platform. In this way you have only the exposure of the corner instead of the whole width of the platforms. Another method employed is to drop the platform into a chute at the side of the platform stack.

Housekeeping is a major problem and also of major importance, because of the vast amount of material that is kept moving through the plant. Since wide skids are moved about the plant, it is necessary to maintain wide aisles. The best solution is to mark all aisleways and to issue definite instructions that all materials must be kept outside of the aisle markings. This is also important in case of fire.

Blocked aisles may act as a trap to employees trying to gain exit at such a time. Scrap paper and damaged materials should be removed. Scrap paper constitutes a slipping hazard of the first order. Rollers and shafts should be placed in racks and not permitted to lean against the walls, posts, or permitted to be scattered on the floor.

Good housekeeping means a faithful job of cleaning up around the presses, removal of dried inks from the floor and from the press. I remember a few years ago when a concern lost a large Roto-Gravure press through a fire. The dried ink on the floor and on the press definitely contributed to the loss.

Proper illumination plays a part in good housekeeping. Too little light leads to eye-strain and fatigue, while glare or too much light will do the same. Many chronic headaches for which workers consult an eye specialist are partly due to working under poor lighting conditions. Aside from the effect on health, proper lighting is an excellent preventive measure for accidents. The lighting of passageways, stairways, and exits should be adequate to permit workers to progress with reasonable speed and safe footing. Many facts and figures are available as to proper candle power for certain jobs, but probably the best solution is to consult your local power and light company.

Considerable quantities of lead are handled on different operations throughout the printing and publishing industry. I should like to pass along some information, which was the result of a study made by the Wisconsin State Board of Health and several other cooperating agencies. This study revealed that the amount of atmospheric lead present over the metal pots of operating Linotype, Monotype, and Ludlow type casting machines is not sufficient to necessitate the installation of ventilating equipment for its elimination. Your own state requirements should be checked to determine whether ventilation is necessary and not just assume from this study that it is unnecessary.

In cases, however, where the metal pots are gas heated or where old type is added to the metal pot, an exhaust system designed to take care of the products of combustion and the fumes resulting from the hermetic ink should be provided. While the time required for removing the dross from the surface of the metal pots is comparatively short, the operation should be performed with care in order to prevent the liberation of excessive amount of lead dust. Dross removed from the metal pots of casting machines should be kept in metal containers rather than thrown on the floor beneath the machines.

If wire brushes are used to clean plungers, the operation should be performed at a



location where the dust liberated will not enter workrooms. The use of the mechanical plunger cleaners materially reduces the amount of lead dust dispersed during the operation. The cleaning of plungers by immersion in cold water is the most satisfactory method from the standpoint of reducing the health hazard involved in this operation. Where this method is used care should be exercised to see that the plunger is free from water before placing it in the metal pot. It is also important to see that the floor around type casting machines be kept free of lead dust.

The cleaning and drossing of remelt pots probably has the greatest lead exposure. Dust is liberated during stirring and also during the time the powdered dross is carried from the pot to the dross barrel. Where remelting is done at frequent intervals, a mechanically ventilated hood should be provided over the remelt kettle and dross barrel. The dross barrel is located at the rear or side of the kettle and is connected to it by a duct. With this arrangement it is possible to transfer dross to the barrel directly through the connecting duct. In this way all the operations common to drossing are carried on under the ventilated hood. The National Safety Council News Letter of the Printing and Publishing Committee of March 1948 shows a sketch of this method of drossing.

Medical examinations were made in connection with the studies made by the Wisconsin State Board of Health. The medical studies confirmed the air studies that in general no appreciable lead hazard exists in the composing portion of the printing trade apart from the unprotected plunger cleaning and remelt work. While this lead study revealed no serious lead hazard in the printing industry, it does not follow that ordinary precautions are unnecessary. I might mention that the Illinois State Department conducted similar tests with about the same results.

In some plants we have open covers on reservoirs of ink feeding the presses. These covers should be kept closed at all times to minimize the solvent exposure used in the ink. It must be kept in mind where you have a fire and explosion hazard, and, I am thinking particularly of ink rooms, that it is essential to use explosion proof type motors, lights, and switches which conform with the national electrical code.

Inks produce a health hazard primarily because of the solvents used. The greatest offenders are the inks used in connection with roto gravure work, which require the fast drying quality. Benzol, of course, is very toxic and can lead to chronic poisoning if inhaled in sufficient quantities over a prolonged period of time. Some years ago there was a death reported in Philadelphia as a result of using inks containing benzol.

The most effective way to avoid the possibility of receiving materials containing benzol, which are sold under trade names, is to specify on the purchase orders that such materials are to be free of benzol. Satisfactory substitutes are available, and I believe the printing industries are taking steps to use more of the nontoxic materials.

Almost in this same category comes type cleaners. Some of the favorite cleaners, again because of the fast drying quality, are benzol, carbon tetrachloride, methyl alcohol, and trichlorethylene. The best solution for the benzol problem is to use a substitute which is known to be less toxic. This can frequently be done by using high boiling petroleum distillates which are considered relatively safe as far as the health hazard is concerned. Flash point on many is about the equivalent to kerosene. Again let me repeat—it is well to inquire into the hazards of some of these products that you are not familiar with, which are purchased under a trade name. While you may buy a product knowing it is not a fire hazard you may introduce a health hazard.

Just three weeks ago we had a death case as the result of a fire when an operator was doing type cleaning with an open can of gasoline. Certainly there should be no excuse for using open containers and exposing the employees and the entire plant to this fire hazard.

The amount of solvent dispersed in the air during the cleaning operations can be greatly reduced through the use of approved safety cans and plunger cans. In using a plunger can, a downward pressure on the plunger forces liquid up from the can to moisten the sponge or swab. As soon as the pressure is released from the plunger, it rises, permitting the surplus liquid to flow back into the can. Such a can practically eliminates spillage and evaporation and effects a distinct saving.

Dermatitis enters into the picture when we talk of inks and solvents. Practically



all solvents will cause dermatitis if prolonged contact with the skin is permitted. The first principle for preventing skin trouble is cleanliness.

Protective creams can be of much help. We find, however, workmen are careless about the faithful use of the creams which frequently results in reoccurring dermatitis cases. Solvents, chemical preparations, abrasive materials which scratch the skin should not be used for fear of creating chronic skin conditions. Pure non-irritating soaps, soap powders, or sulphanated liquid soaps, as well as plenty of warm water are essential for adequate washing. Individual towels should always be used. Cases of skin trouble should be given prompt attention to determine the cause and to give prompt treatment to effect recovery.

The practice of spraying printed sheets with no-offset solutions has become quite general and has on many occasions brought up the question of whether or not this operation constitutes a health hazard. Checks have been made on the ingredients of the spray solutions of several manufacturers and in no case have they found any ingredients which were harmful to health. On one or two occasions there have been reported cases of allergy to the solution. Ventilation is desirable to prevent the spray from accumulating on the press and nearby objects and also to maintain a clean atmosphere.

While we do not want to go into programs in this discussion I would nevertheless like to point out that if your plant does not have a good, sound, organized safety program, that you look into it immediately. You and the employees in your plant are the only ones who can profit by it.

In this discussion I have tried to point out some of the more common hazards in the printing and publishing industry, and if I have reminded you of only one hazard that has been overlooked in your plant then this time has been well spent.

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## Creating a Point of View Toward Safety

**(Panel Discussion)**

*Discussion Leader:* HENRY P. CONKEY, President, W. B. Conkey Co., Hammond, Ind.

*Participants:*

E. BARON, Vice-president, Pacific Press Inc., Los Angeles, Calif.

ALEXANDER HOUSTON, Chicago District Engineer, American Mutual Liberty Ins. Co., Chicago.

L. A. SHORTZ, R. R. Donnelley & Sons Co., Chicago.

### 1. Shall We Abolish Safety Rules and Regulations?

MR. CONKEY: Our panel discussion today will be held with the idea that we can create a point of view towards safety. We have three able participants who will discuss four definite questions. The first of these is: Shall we abolish safety rules and regulations? You know, when I first saw this topic, I wondered how anyone could answer in any way except in the negative. Yet I have been surprised to find that there actually are many points of view concerning safety rules and regulations. I thought you might like to share some of these views with me.

We find that every safety rule is based on history—tragic history. Violate that rule and another similar accident is almost certain to follow. Safety rules are not meant to be used as a curtailment of personal liberty. They were meant to be, and still are used, as a means of protection against a loss of life or limb—something which cannot be retrieved.

We know that regulations, and safety rules are no exception, grow up with the development of every craft, and each person who is responsible for the training of an apprentice hands down these rules. Sometimes they become tradition and are thus adhered to faithfully. This procedure is fine in small plants. But, as an industrial organization grows, accurate presentation of safety rules to the far-flung personnel becomes a different problem, and the rules must be reduced to written form.

Most of us will agree that rules are needed in the ordinary conduct of life. As children, we play games according to the rules, and when someone breaks a rule, our games are disrupted. So it is with industry. We have discovered that hazards go with certain jobs and have adopted rules to avoid injury from these hazards. If these rules are broken, our production is disrupted. There is no objection to rules in childhood games nor should there be in the real game of producing a livelihood.

I find, however, that psychologists are prone to tell us that employees, on the whole, do not like to be ruled. They like to be told that this is the best way to do things, and then they will tend to obey as instructed. Yet one psychologist said that thirty per cent of employees want the "rule of the thumb." They want an exact rule on this, and an exact rule on that. They tend to abide by the rule faithfully, and if there is no rule, they are completely lost.

Now, the thing to find out is which of the two groups are having the accidents—the thirty per cent who want the "rule of the thumb" rule or the seventy per cent who object to this procedure?

The question then—shall we abolish safety rules and regulations?—becomes very important in creating a point of view towards safety, and if we do have safety rules, what good are they unless everyone in the plant and office abides by them? What is your opinion of having safety rules?

MR. BARON: Mr. Conkey, you have already given the obvious answer. Of course they are absolutely essential. They are essential especially in the case of a new employee. After an employee has a certain amount of experience, he picks up the proper practices from the guiding personnel who train him. But the new employee is overlooked many times.

A new employee is brought in to a low-grade job of, perhaps, hauling skids around on a hand-lift truck. If he hasn't been told not to, you may see him riding the truck around the plant as a scooter.

You can imagine what happens. With very little control on the front wheels, he can fly into a machine or other personnel and do real damage before he knows safe practice and safety rules. The rule about "no scooter riding" should be given to him the minute he comes in the plant.



MR. CONKEY: What good is a rule without a penalty? All the games we have, we play according to rules. When an umpire says, "Five yards' penalty for rough handling," that means something. If there is no penalty, who cares about the rules?

MR. HOUSTON: I would like to read from a few notes I have.

Safety rules and regulations are for the guidance of the majority and must be enforced because of the actions of a minority. Take away safety rules and regulations in any plant and their enforcement by disciplinary action such as warnings, layoffs and dismissals, and you will have an increased frequency of accidents. Unfortunately, there is always a small minority who, more or less, have to be forced, under the threat of penalties, to do things correctly or safely.

MR. CONKEY: I have heard a lot of argument about that. Do you fire a man you spent fifteen years training? Maybe you are not so severe. We have rules against spitting, but somebody spit. If they catch him, they say, "Was he a good man or a poor man?" If he is a tracker, you can throw him out. But let me find a man who is a good night worker on a trimmer, and it's funny how the thing doesn't work.

MR. HOUSTON: You spoke of throwing out a man with fifteen years' training. Of course, if a man is properly trained in the first place, he wouldn't do that.

MR. CONKEY: I have been driving an automobile for about forty-two years. I find I break rules—not intentionally—but I break them. What will I do—have my head cut off? What are you going to do—fire me?

MR. HOUSTON: No. It is a question of judgment. Most plants have a system of disciplinary action. First, there is a warning. The second maybe is a warning if it is a minor offense. The third is possibly a short layoff. Possibly the fourth is a longer layoff. But eventually you reach a point where you can't control the man, and he will kill himself or somebody else, so you fire him. You finally throw up the sponge, and it is the best thing to do for the man's own good.

MR. CONKEY: Do you agree with that, Mr. Shortz?

MR. SHORTZ: When you have a rule, you have to have some kind of a penalty

for some people in order to make the rule effective. You should go along with an individual and give him adequate warning. If he still doesn't adhere to the rule, take him off that job.

MR. CONKEY: Are we to conclude from this discussion that you think we should have safety rules and penalties attached which vary according to the magnitude of the offense and the number of times the offense has been perpetrated?

MR. SHORTZ: Yes.

MR. CONKEY: Have you anything worked out along the line of plans for each individual plant?

MR. HOUSTON: First, it is a warning. Second, it is a layoff. Third, it is dismissal. You feel that the man has had two chances. You have worked on him and tried to educate and train him. If it can't work, the best thing is dismissal.

FROM THE FLOOR: Why aren't these rules followed? Most rules are so simple that they insult the intelligence of the workers. Just horse sense would tell him he shouldn't ride a truck. Why should you tell him that?

MR. BARON: There is a surprising lack of horse sense on the part of some new employees. I was pointing up the necessity of rules particularly in the case of a new employee who is not experienced in that type of operation. It takes rules to point out the things that shouldn't be done.

MR. BROWN (Rand McNally & Company, Chicago): Where do accidents come from—new employees or old ones?

MR. BARON: They come from a combination. You have to work on both groups and keep working on them. But new employees have accidents because of inexperience and old employees have accidents because they get so used to the operation they get a little careless.

FROM THE FLOOR: I am against safety rules and regulations that are as simple as most safety rules are. I think you have to make the people a part of the rules and regulations so that you aren't driving them and forcing rules down their throats.

MR. BARON: It takes a good selling job. You just don't put up the rule and say, "That is it."

MR. HOUSTON: Have you ever thought of what the average I.Q. is of a group of employees?

FROM THE FLOOR: I would say in the printing and publishing industry it is a way above average.

MR. HOUSTON: That probably is true. A great deal of the labor is skilled help.

SECOND VOICE FROM THE FLOOR: Don't you think that while one rule might be obvious to a particular person, another might be very enlightening to him. A rule is not designed for specific individuals. A rule is designed for an over-all accomplishment. Where you are dealing with a large number of people, all with varying degrees of skills and intelligence, you are going to accomplish your ultimate goal more successfully that way than you will by some specific individual appeal.

FIRST VOICE FROM THE FLOOR: Has anybody accomplished that by posting rules?

THIRD VOICE FROM THE FLOOR: Don't post penalties. Don't post anything saying that the man is going to get fired. Post them constructively. If you have penalties, don't post them, because people hate to read penalties. But I would post the rules. You must have rules and you must have penalties.

MR. HENRY BERMAN (Rand McNally & Company, Chicago, Illinois): I think the difficulty is that we establish a rule, and then we think the job is done. It is more important to build a safety attitude. For instance, we have the obvious rule that we should look both ways before we cross the street. A person follows that rule and thinks he is crossing the street in perfect safety and gets hit by a car.

It is much more important to have them alert at all times to the danger of cars. I believe that building a safety attitude is probably more important than just rules. The rules aren't worth anything unless you use them intelligently.

MR. CONKEY: Well, I think some rules are definitely essential and they must be. Other rules, I think, are trivial. I have seen some rules promulgated in our plant that—I agree with one of the speakers here—I thought were nonsense.

MR. ROSENDAAL (Courier Journal, Louisville, Ky.): I would like to ask Mr. Houston when he states that a man is given two warnings and fired on the third one, wouldn't that be the exception that proves the rule that you finally get to the point where you must fire the man? If you have, as we have, fifteen hundred employees, I venture to say the percentage of people you would have to fire on the third violation would be very, very small.

MR. HOUSTON: Ninety-nine times out of a hundred you can take an employee aside and explain things to him and get results.

I think some of us have resentment against "Don't do this," and "Don't do that." Suppose we make positive safety rules. "Do do this," and "Do do that," and leave out the "don't" stuff. But then we forget that safety rules are for the guidance of the great majority of employees.

In other words, you have certain operations in your plant which must be carried out in a particular manner, otherwise, the employees will get hurt. A certain guide must be used or the paper lifted in a certain way. Those rules are there for guidance and not from a negative standpoint.

MR. BROWN: We have a right to compromise here and say that rules should cover important issues. We should not have little rules such as those prohibiting riding a truck.

MR. HOUSTON: Don't post a sign, "Don't run." Post a sign, "Please walk."

MR. BROWN: "You will live longer if you walk." There are a lot of slogans of that nature.

MR. SHORTZ: Under that policy, if you found a man who insisted on running, and you didn't have a rule in effect that he couldn't run, you couldn't discipline him.

MR. BROWN: I don't think you want to discipline him.

MR. SHORTZ: I think there are some circumstances where you might want to if he persisted.

MR. SMITH (R. R. Donnelly & Sons Company, Chicago, Illinois): I know of a plant where a young lady was seriously injured. She was walking down an aisle, minding her own business, and some joker came running down the aisle and knocked her down. He wasn't hurt, but she received a fractured skull.

One of my big problems is to try to keep people from running. We have tried a number of different approaches to it. One of the effective methods that we have found that sometimes works is this: When you catch someone running on the way out of the plant at night, stop him and talk to him for five or ten minutes and after you are all through talking to him—not about running but about anything else—say, Do you know why I stopped you?" If he says, "No," you say, "Well, you were running, and we have a rule in the plant against running. It is dangerous. We have had people injured because of running in the plant."

MR. BROWN: Why did you mention the word "rule?" You could have gotten along without "rule," couldn't you?

MR. SMITH: No, I don't think so because we have found over a period of time that running has been one of our big problems, and we have finally resorted to establishing a rule to prevent it. We have signs in our stairways asking people to walk. It doesn't say, "Don't run." It says, "Walk."

MR. BROWN: Doesn't the sign lose its effectiveness after the first few days? You may just as well take it down.

MR. SMITH: That is true. We don't leave it up continuously. We keep putting it back every once in a while to bring it to the employees' attention.

MR. CONKEY: There is one thought I don't think we have covered here. That is the point establishing penalties and publicizing them. Do you approve or disapprove of publicizing these printed recommendations for safety? If there is an objection to the word "rule," let's call them recommendations, do you approve of having the penalties set opposite them?

MR. BARON: It is very difficult to have a set scale of penalties. They have to be administered with a good deal of judgment. You are not going to fire your graveyard-shift gathering machine operator because he spits on the floor. On the other end of the scale, the cutter who deliberately plugs his two-lever safety mechanism, you are going to get rid of in a hurry. You are going to give him a warning the first time, a layoff the second time, and if he doesn't straighten out after that, you are going to

get rid of him. No matter how good he is, he is too much of a liability to himself and to the company.

MR. CONKEY: I take it that you do not feel the penalty should be publicized.

MR. BARON: I think it would be very difficult because there might be some consideration in a particular case where you should'nt go along with the penalty exactly as you publicized it. You might want to adjust it one way or the other. I think you should use good judgment, give proper warning and firm action.

MR. HOUSTON: Every employee should be made to realize that if he does certain things, certain disciplinary action is the penalty. Why do I drive forty-five miles an hour on the Outer Drive? Because I know if I drive fifty-five miles an hour, I will pay a fine. If I didn't know that fact, I would be driving sixty some night when I am in a hurry to get home. Penalties should be publicized to the extent that all employees know about them and know they are going to have to pay the penalties. Going back to that same angle, suppose that is the third time I have been caught speeding. Therefore, I deserve a higher fine than the man who was caught the first time and given a $10 fine against my $25. In other words, as Mr. Baron pointed out, you use judgment.

MR. CONKEY: You do want the penalties stated but not publicized, but management will have them.

MR. HOUSTON: Yes.

MR. SHORTZ: I don't believe the penalty should be publicized, but it should be known by the people in some way or other, as you would post the rule. Then you will have to treat all people alike. If you have your penalty system where it is a warning the first time, a layoff the second time and dismissal the third time, you have to abide by those regulations regardless of who the individual is.

MR. MASTERS (Aluminum Company of America, LaFayette Works): Would this panel advise the posting of job rules in order to make your safety program more personal? Would you recommend the posting of job rules where a plant has operated for five to ten years with no such rules posted?

We have a situation in which the men are not stabilized on a job. They may come up to a job on a particular day and the rules, such as we have, have been communicated verbally by the supervisor and the foreman. Now the question has been proposed by management that we post job rules.

MR. CONKEY: I don't quite follow you. What do you mean by "job rules?"

MR. MASTERS: They are job rules pertaining to safe operations—safe practices.

MR. SHORTZ: The posting of a rule should not take the place of training on the job, which would include safety instruction.

MR. MASTERS: The real purpose for the posting of the rules, as one gentleman here suggested, is to facilitate labor relation activities. If the rule is violated and the union asks the question, "Has this man been told?"—the company can say, "Yes, he has been told." We have nothing in writing to that effect.

MR. HOUSTON: If you are doing a good job with your present method, I don't see why you shouldn't continue it, outside of a formal notice. With that, you can say to the union steward, "There is the rule right over his head." I think that is the main purpose—not any effect that you are going to get out of it in having the employees work any more safely.

MR. BARON: Perhaps I should add something to my previous remarks when I said I was not in favor of publicizing penalties. We have an employees' manual which lists, among other things, the causes for dismissal. One of them is the disregard of safety rules which is a general statement. What I am against is the listing of the kinds of violations and then listing the kinds of penalties.

### 2. Are Incentives Essential in a Successful Safety Program?

MR. CONKEY: I trust you all have a pretty definite idea of what the feeling of the panel is on the matter.

The second question is: Are incentives essential in a successful safety program?

It seems that incentives, on the whole, act as interest-getters, and it is amazing to learn of the various incentive plans in existence. Let me mention just a few and then I'll ask for a show of hands among our panel as to who wants to tell us whether or not incentives are essential in a successful safety program.



Employees of one company, I am told, have a direct financial interest in the company's safety record because the accident experience is reflected in the bonus payments to employees. They understand the phrase, "It pays to be safe."

Another company, as an incentive to attain a good safety record, gives fully paid life insurance policies to workers who complete a year's work without a disabling injury or inexcusable absence from duty.

Another company gives each employee who goes three months without a lost-time accident a coupon which is worth $5 in trade at its commissary.

Still another company gives valuable prizes such as an automobile every six months, engraved watches, table silver, framed prints and pictures, and one-hundred-volume sets of fiction. Their thought was that one likes to take a chance and, instead of doing the chance-taking at the job, it was better to transfer this impulse to a comfortable room where the prizes could be won through the customary method of pulling out a name from a capsule in a glass bowl.

Still another company is always giving away money in prizes and is looking for unusual contests, believing in the idea of giving the American public something for nothing to stimulate interest.

MR. HOUSTON: There is only one answer to the question, "Are incentives essential in a successful safety program?" "Yes." A successful safety program in any plant or any type of activity is one that keeps individuals from getting hurt. That is the main gist of any safety program. Even with the best of all possible safe working conditions such as proper selection of employees, good training, proper supervision, good equipment, good physical conditions, good guarding, and a safety-minded management, individuals without incentives can, and will, still get hurt while working.

The main incentive is that age-old one—"If you don't take care of your own neck, nobody else is going to take care of it for you." That, to me, is one of the main incentives for keeping a man working safely.

Another one is the threat of loss of income and earning power. "Who is going to take care of the wife and kids if I get hurt so I can't work?"

There are numerous other personal incentives that keep people working safely, but I do not know of any others that are more important than these two—protect your own neck and protect your folks.

Incentives, such as competition between plants or departments for the best safety records with rewards such as a dinner or a party for the winners, may be important, practical and pay dividends, but I wouldn't classify them as essential.

If we mean an incentive such as a monetary reward for no accidents, I do not believe that such an incentive is essential. However, I will say that in certain activities where we have to rely on individuals with very little supervision, such monetary incentive is quite important and actually pays such dividends that we might classify it as essential. In particular, I am referring to truck fleet operations where we are depending upon individual drivers not to have accidents, and you cannot have much close supervision.

To make it workable, the monetary incentive has to be high enough to be attractive, such as the winners receiving anywhere from $50 to $500 at one pay-off. I do not believe that such an incentive would be economical or practical in a large industrial plant due to so many employees working without accidents thus necessitating a very low pay-off which would defeat its purpose by losing attraction.

In other words, from a monetary standpoint, if you are going to give a man something, you have to make it large enough so as to make it sufficiently attractive to work for. In a large plant with seven to ten thousand employees, a dollar every month or a dollar every six months won't mean too much.

Where you make the monetary incentive large enough so everybody is working for it, such as in quite a few trucking companies where a driver knows he can win $500 at one crack, it means a lot to him and he is in there pitching.



MR. SHORTZ: It depends on how you define the word "essential." I don't look upon an incentive as essential because an incentive isn't the basis of a safety program. The key to a successful safety program is supervision. An incentive would be helpful but not essential. The basis of a good safety program is the way you train your people and the discipline that you have among the working force. In that case, it would be helpful but not essential.

MR. CONKEY: If you were operating a trucking firm, you would disagree with Mr. Houston? You wouldn't give $500 if he had a perfect record?

MR. SHORTZ: No. I think it would be very well done by having proper, supervision and proper training. I would try to put that money in the form of healthy wages rather than as incentive for good behavior.

MR. HOUSTON: If you have a trucking company, you are dealing with individual drivers. Some of them are a pretty nice bunch of men to get along with. Others are quite difficult. It is impossible to closely supervise their activities. In other words, you can't have a supervisor out tailing every man or riding with every man you have on the highway.

Therefore, the major part of the safety program is in proper selection first, and proper training. But we have found that these drivers figure they are working for a living. When you talk to him through his pocketbook it means something to him, and he actually will take a great deal more care in his own personal driving and more care of his own equipment.

MR. CONKEY: I don't imagine the printing and publishing industry, as a whole, employs a good many truckers. That application is all right as far as truckers are concerned.

I take it, Mr. Shortz, like Mr. Houston, you don't approve or consider it essential to pay press men, book binders and photo machine operators a premium or incentive if they have a perfect year's record?

MR. SHORTZ: No, I do not.

MR. BARON: I think this truck driver situation is a little bit different than the situation we find in the printing business. There you are dealing with individuals where you aren't able to get full control over them. I have no doubt but what that program would be sound in a case like that where you are operating with individuals. Where we are operating with groups rather than individuals, I think other incentives are better.

We don't use any monetary incentives but we create an incentive in departmental rivalry, for instance, by posting the departmental records. This creates a genuine rivalry between the departments to better their records and bring their records up to the top of the list. That, I know, is touched on in a later question.

Then we also have the basic incentive which, I think, is the individual's own personal safety.

MR. CONKEY: Well, I didn't interpret this question to mean anything other than either monetary or prizes—something that the individual could take home other than his good health. If my interpretation is correct, then is it the conclusion that we do not believe, in the printing and publishing business, that the awarding of an incentive in the nature of cash or its equivalent to an individual or to a group is a wise policy to follow? Is that the consensus?

MR. HOUSTON: I agree with that.

MR. SMITH: What about safety contests, slogan contests and poster contests—contests which do not hit just one group but all groups or all employees throughout the whole plant?

MR. HOUSTON: That is a major factor in trying to get your employees working safely. But I do not believe you could classify it as essential. It isn't one of those things, such as good supervision and good training, which I classify as absolutely essential.

### 3. When Is an Employee Safety Conscious?

MR. CONKEY: So far, we have been creating a point of view towards safety, first, through the discussion—Shall we abolish safety rules and regulations?—and, second—Are incentives essential in a successful safety program? Now the third is a question that, in my opinion, is a difficult one to answer—When is an employee safety conscious?

In my dictionary at the office, one of the definitions of "conscious" is "present in the mind." Thus we might amplify this question and ask when is safety present in an employee's mind? Would you say an employee had safety on his mind when he did things in a safe way by habit? Would you say he had safety on his mind when he notices a hazard and calls it to the attention of his foreman immediately?

Would you say that he had safety on his mind when he looks out for his own welfare but not the other fellow's? Would you say he had safety on his mind when he is undergoing a great mental strain because of family difficulties? Would you say man was *safety-minded if* he exerted h efforts to legislate against human carele ness?

MR. BARON: Part of that definit was being "present in the mind." An e ployee is safety conscious when he thinks ahead—not only of his own safety but also of the safety of others working with him and the safety of new people coming under his direction or new people coming in to work alongside of him.

I think that is best presented by an example. In the printing business, we have several departments using saws, rollers and that type of equipment where an operator in order to use them is looking directly at the blade and has his back turned generally to anyone who might be coming up from behind. A number one safety rule, in that respect, when someone comes up behind you and talks to you, is never to turn to him until you are through with your work on that machine. When you are through, push it away and go back and then talk to him.

A man is safety conscious when he is thinking of things like that and will get that over to a new employee. Many of them don't think of these things, and more experienced employees are the ones best fitted to transmit that to new employees. He thinks safety when he is thinking of helping new employees, and he is thinking of his own safety and the others right alongside of him.

MR. BERMAN: That man who walked up behind the man operating the saw certainly wasn't thinking of anybody's safety. He was very much in a blank on safety thoughts.

MR. HOUSTON: To me, an employee is safety conscious when he is working in such a way that he does not get hurt or injure other employees. That is fundamental. He is safety conscious when he will attempt to correct unsafe working practices of others; when he corrects unsafe conditions in equipment or attempts to have them corrected; when he will maintain good housekeeping, good working habits and wear proper clothing and safety equipment; when he won't tackle a job without knowing how; when he has the right equipment to tackle a job.

If you have a man of that caliber, working with those practices, I would say offhand, you have a safety conscious employee.

The only way to get that man, first of all, is the correct selection of the right employee for the right job. In other words, you train him right. Part of the training is good follow-up and part of it is supervision.

From your definition, he is about perfect. He not only has to look out for his own welfare but that of everyone else.

### 4. Should Safety Records Be Publicized in the Plant?

MR. CONKEY: In creating a point of view towards safety, we have discussed three subjects. Now we come to the last which seems to be an almost ethereal question—at least it is to me—because when I discussed it with several safety directors, they said, "You know, it's funny, but every time we publish a good safety record, several lost-time accidents are sure to follow." Then numerous cases were brought up to substantiate their statements. They admitted that they weren't superstitious in any other respect, but this happened too often for them not to be superstitious.

Mr. Houston, will you tell the audience what you think about this question: Should safety records be publicized in the plant?

MR. HOUSTON: When you are a proud father for the first time, you shout the news of your achievement from the housetops. You are very proud of it. I think the same thing pertains to a good safety record. When it is good, all the employees who helped in its achievement want recognition so they can say to others, "Nice going, Joe. Let's see if we can stretch it up for another year."

When it is bad, it will help to publicize it in your own plant. But you don't want anybody else to know about it. Otherwise, it will be difficult in hiring new employees. It makes employees stop and think: "Can this happen to me? Maybe I had better watch my step a little more in the future. No more chances for this guy. Joe Doakes next to me got hurt. Everybody in the plant knows about it. I know about it."

Then, too, when you publicize a poor accident record by departments or under the names of the supervisors responsible, which is one thing that I like to see in plants, the low man on the totem pole is going to take steps to get out of that hole position either through shame or kidding or the fact that management might start asking a few embarrassing questions.

We had a safety contest in a large navy yard that I was once connected with. We had about 57,000 employees. We publicized the record of the accident standing each month. It was surprising how many shop masters came in at the end of each month, when they found they were at the bottom of the list, and asked what we could do to help them out. They were very much more cooperative, we found out, in the whole project because the admiral had a habit of calling in two or three shop masters and asking: "Why should your department have a poor accident record month after month?"

MR. CONKEY: You are not superstitious then? You haven't had that experience?

MR. HOUSTON: Yes, I have had, but *I am not superstitious.*

MR. BARON: We have also had that experience and we are still not superstitious. In one of our general safety meetings, we had the good news given to us of how we had reduced the loss ratio from a very high figure of about fifty or sixty per cent down to eight per cent over the recent two or three months. Immediately after the announcement we heard that we had a couple of serious accidents. But we are still not superstitious.

We go along with the idea that you should publicize safety records, and we do that, giving the departmental standings. We don't publish them down to the very last detail of how much this thing cost or who got hurt and how badly but we show a departmental relationship, which we believe is enough to create a little rivalry between the departments.

Mr. Houston here mentioned the low man on the totem pole. That brings to mind a program that we are just undertaking now. One of our good neighbors, your own Illinois Glass Company created a totem pole on which were arranged spaces from top to bottom, according to the number of departments. They made up caricatures of the department heads which would fit in these spaces.

Then organized a survey committee which made a plant tour at regular intervals and rated all the departments on the standing of their good housekeeping. In accordance with those ratings, the best department went to the top of the totem pole and the worst went to the bottom.

In a short time their situation has just changed from one extreme to the other. It has changed their situation from extremely bad to extremely good.

MR. SHORTZ: Well, when I read that question, I wondered what kind of safety record they referred to. Whether it would be a safety record that stated the number of lost days and the frequency and severity rates or an individual safety record that would name the people? I believe that, of course, it would be very well to publish the number of lost days and you could state your severity record or your frequency record.

But if you published a detailed record of the individuals involved and the number of days that those people lost, it would be placing a finger on that individual and pointing him out for criticism to the rest of the people which would not be wise. From that standpoint, it wouldn't be right, so I would publish a general safety record of the department or the plant as a whole.

MR. CONKEY: And if you adopted the plan of the departmental record, would you post that in each department?

MR. SHORTZ: It would be well to post it in each department. I could see no objection to that so long as it did not refer to individuals, but rather to departments or units.

MR. CONKEY: Doesn't that cause the same reaction as it would on individuals?



Couldn't you say: "The foundry is a bunch of nitwits. They are not at all safety conscious. Look at their record. Why they are awful?"

MR. SHORTZ: You don't single out any particular individual in the department for criticism. You are using them as a unit, and you are criticizing the department as a unit. It wouldn't be as objectionable as taking the individuals who made up the department and saying, "Those are the ones who made the department's record bad."

MR. CONKEY: Usually isn't that under the supervision of the foreman of the department and doesn't that again reflect on the foreman?

MR. SHORTZ: The foreman should take the reflection in that case, because he is the one responsible for it.

MR. CONKEY: Then you are perfectly willing to point out that the foreman is a nitwit but the rest of them are all right?

MR. SHORTZ: Yes. Putting it that way, I think that is so because it is his responsibility.

MR. HOUSTON: I agree with Mr. Shortz now one hundred per cent. You single out the foreman, and you give it to him. He will get it anyway from the matter of shame. You want to shame the department as a whole but not the individual who had the accident. The foreman is not classified as an individual when he is foreman. He is taking the rap for the whole department.

MR. BARON: It is time he was, if the foundry is that bad. Perhaps by publicizing a record like that, there will be a big improvement. If there isn't you need a new foreman. I think very definitely that the foreman has to take the rap. But we keep away from individuals. In our own particular case, we take some sting out of it by using thermometers with mercury in the thermometers, showing the levels of the departments. It doesn't get down to the specific so much that you can point a finger at any one individual. It gives the relative standings and is a good incentive for the low departments.

MR. BROWN: Don't you have to show the man-hours?

MR. BARON: I would like to ask our personnel manager to tell you that.

MR. RICHARD HOWARD (Personnel Manager, Pacific Press, Inc., Los Angeles, California): We do use the man-hours. Before we initiated this, we saw that it was obviously necessary because you have a wide variation of man-power and man-hours so, to make it equitable throughout the plant, it was figured on that basis. It has produced a very excellent result.

MR. BROWN: Do you use the number *of machines?*

MR. HOWARD: No.

MR. BROWN: They should be used.

MR. HOWARD: If you were going to carry it out to the mathematical completion, it should be. Our purpose is not to create a chart of mathematical statistics. We want to give the relative standings so that the thing will serve as an incentive.

Incidentally, in connection with the foreman, particularly in a large department where you have three shifts operating and you have a superintendent for the shifts, many times the superintendent is not aware of the accidents that are happening to a particular individual.

We nailed down the accidents to the individual, however—not in a public way—but we make sure that the foreman of the department head knows exactly whom the accidents are happening to and how many each person has had and so on. We feel it is his responsibility to carry that to the individual and not to make it a matter of public property.

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**Volume 22**
**Transactions**
**1948 National Safety Congress**


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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## PUBLIC EMPLOYEE SAFETY COMMITTEE

This volume is a record of the sessions held at the 1948 National Safety Congress by the Public Employee Safety Committee. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Public Employee Safety Committee carries on in behalf of its members, and for the benefit of accident prevention work in the field of public employment generally. The committee gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of public employees. The activities of the committee are under the direction of its Executive Committee, the members of which are listed on page 19 of this volume.



## Standardizing Accident Statistics Among State, County, and Municipal Governments

By GEORGE R. HAY
Safety and Claims Examiner, City of Akron, Ohio

One of the great hidden costs of work is an accident, whether or not anyone is hurt. The total cost of injury accidents alone in state, county, and municipal governments can be conservatively estimated at $200,000,000 per year, or a sum sufficient to meet the payrolls of all cities in the United States for one month.

In spite of this tremendous loss, personnel safety movements in these same subdivisions of government are in their infancy. Governmental units have just begun to realize this tremendous inefficiency. By strange coincidence in a lot of cases, the conservative taxpayer is complaining that an employee accident prevention program is just an added frill of government, that this movement is just another attempt to create more public jobs.

This problem of personnel safety is not new, yet its worth is just beginning to be realized by local governments. In the steel industry, injuries have been reduced to almost an absolute minimum. The injury loss, on a per employee basis, is now less than 20 per cent of the same cost to the public employer.

Public officials, in periodicals devoted to government, publicize the extent of their highway construction programs, the efficiency of their water departments, the size of their sewerage systems, the garbage tonnage they handle, their fire record, their financial record, or other like accomplishments of government. They compare the effect of these accomplishments on a common ground with either what existed previously or what other cities might have accomplished.

In the field of traffic safety a national problem has been recognized. A public official, even when running for office, will make a campaign issue out of the way traffic is being handled. He will speak at great length on how he hopes to accomplish better control of vehicles. Many cities and some states prepare long and attractive annual reports that are used in trying to attract new industries to their localities. In these reports great attention is paid to details of operation.

In all of these previously mentioned ventures of government there is a common ground of comparison. These common grounds make good newspaper copy. Because of the fact that so few public employers realize how to measure injury losses, little or no publicity is given to the tremendous injury accident loss. I have yet to see an annual report of any city that mentions its personnel safety record. Few, if any, advertise their efforts along this line.

In fact, I believe it is safe to say that few public employers even know their accident cost or injury rate. The expense of this part of the government never goes into the publicized cost of any public project. Should these be included in the cost of these projects as a direct item of expense, I believe that the frugal taxpayer would really become alarmed. The public never knows the cost in human lives, or the cost in pain and suffering, or the cost in lost time due to an accident, that goes into the maintenance of governmental services.

Most public officials know their workmen's compensation costs. They realize this is a necessary item of overhead. Universally they feel this is too high. In most states where insurance companies cover this loss these public officials feel that they are being discriminated against in the size of the premium they have to pay, and yet these same public officials do very little, if anything, to discover the real reason for their high insurance rate.

These same public officials, when the word "safety" is mentioned, naturally think first of traffic safety. Why is this traffic safety problem so universally accepted? Do you think that it would have the same publicity value it now has if there had not been some way developed to provide comparative records?

Some time during the history of the development of the national traffic safety



movement a method was devised whereby uniform traffic statistics could be compiled. Now monthly the National Safety Council, as you know, publishes comparative records of a great number of cities and states in the United States. They run a national contest with awards to winning cities. These winning cities receive national publicity. Most states also run traffic safety contests, pitting one locality against the other. In Ohio, winning cities proudly display signs of their prowess at all their entrances.

Due to the competitive spirit that has been developed by these comparative statistics, our national traffic toll is becoming smaller in spit of increased vehicular travel. The public recognition given this problem has resulted in improved policing methods, greatly improved engineering methods, and improved handling of publicity by newspapers and periodicals.

Why wouldn't it be possible for us to develop at least some semblance of this same recognition in personnel safety? We have the facilities at our disposal. We have a standard method of comparison. The American Standards Association has developed a uniform method of compiling accident statistics. It is not complicated, in fact routine work under their formula can be learned with but very short training. It provides, as you know, for dealing with comparative frequency and comparative severity of accidents on a common base of man-hours worked.

A few cities already use this method. We have found that, in our search for comparative statistics during the past year, returns from our request for statistics were so few and scattered that no true picture could be gained of our national or even our state losses.

The use of these standard comparative statistics has many values. For instance, in Akron we are entered in a city-wide industrial safety contest. Our frequency and severity figures are public property, being given to the newspapers monthly. In addition to this, we have aided our safety record by maintaining an interdepartmental booby prize contest which has materially reduced the number of injuries our city employees suffer.

Every department in the city of Akron is given the standing of all other departments monthly. Even our worst department does not like to see its name at the bottom of the list. All we use in this contest are standard frequency rates.

It will be much better for the public employee safety movement generally when we can compare our records with those of other cities or with a national average. History of the safety movement has shown that when national averages are developed, their trend is always downward.

If a frequency rate of say, roughly 20, and a severity rate of .4 is maintained, every year you maintain this rate one out of twenty of your employees receive injuries that disables him and keeps him away from employment. Every one of these so injured will lose about two weeks each from work.

If you have a thousand employees this would mean that you would have fifty lost time injuries and that these fifty lost time injuries would cause a loss of at least 700 work days. Would you as an employer hire three people and pay them for staying home for a year? Should you do this, you would immediately be accused of padding the payroll.

You need to find out the extent of this loss. Someone must be put in charge of this work, either on a full or part time basis, depending upon the size of your unit. Your insurance carrier, your state accident prevention board, the United States Department of Labor, or the National Safety Council can provide you with standard methods to be used on discovering what you have to combat.

While this may be a new problem to you it is not new industrially. I realize that, strictly speaking, preventing employee injuries is an item of expense. It is something whose value is hard to measure in the terms of dollars and cents. Yet savings show up in strange ways.

Years ago industry discovered this value. They went through the same period of organization and development of comparative statistics that we are now starting. Originally they too had a veritable hodge-podge of methods to determine their injury costs. With the assistance of the American Standards Association the present method of compiling of accidents statistics was developed. Along with this they developed industrial safety programs.

Your accident prevention venture need not be costly, but whatever you do, establish your program on a sound basis. Either hire trained personnel or train your own personnel in accident prevention work. Above all, do not cheat on your statistics. Present a true picture. The only person you fool with false statistics is yourself. You have no need to be afraid of a bad record, because a bad record is much easier to improve than an excellent record and anyone working with industrial safety is always interested in improving records.

I am optimistic enough to believe that while the public employer may never be able to equal some of the long no-accident records that have been developed in some industries, a satisfactory level of accident rates will be recorded. Public employment is too varied an occupation to compare with manufacturing procedures, but we can compare ourselves with each other if we have the means at our disposal.

In this comparison all of us will benefit. The efficiency of our work for the public will be improved. Our relations with our employees will be enhanced to the extent that our employees will be proud to work for us.



## Use of Safety Appliances in Municipal Conduit Construction

By JAMES P. BELCHER
Safety Director, Electric Power Board, Nashville, Tenn.

Utility companies have found that safety methods and practices are most effective in preventing accidents. These methods will be described, taking them in order of their application in the construction and operation of an underground distribution system—(1) during duct and manhole construction, (2) during the installation of cables, transformers and switchgear, and (3) during the operation of this equipment.

### Duct and Manhole Construction

In starting a construction job, it is just as essential that precautions be made for safety measures as it is to obtain men and materials. If the surface of the street is to be opened, it must be barricaded off before any work is undertaken. There are two principal hazards to be guarded against, that of the public being injured by the tools and materials handled, and that of the public falling into the openings.

Several methods of barricading off a working space on the street are used. One method is to drive iron rods into the pavement for supporting wooden bars in the nature of a temporary fence. Another method, and almost universally used, is to employ barriers made like saw horses. A long 2 in. x 6 in. wooden rail is placed on edge in slots in the top of two standards. It should be painted either amber or black and white. This is very effective on large objects.

Barriers should be placed in the street in such a manner as to inconvenience traffic as little as possible.

At night warning lights should be placed on constructions.

Tool boxes, air compressors and other equipment should be located with great care. They should be properly guarded and lights be placed by them.

As excavation work proceeds, paving materials and earth accumulate at the side of the opening. These should be handled according to regulations. First, a clear walking space of two feet must be maintained next to the opening. This will also assist in preventing earth and stones rolling back into the trench. At the same time, it is also necessary to see that materials do not roll out beyond the barriers into the lanes of traffic.

Baffle boards may be used to hold back the excavated earth, or it may be possible to pile up paving blocks. Sometimes careless handling of conduit by stacking it or throwing it on piles of earth causes serious injuries. This practice should not be allowed. It is thus very important that a proper place be reserved for all construction materials and



that they be handled with extreme care. Neatness saves confusion and confusion is a frequent cause of accidents.

Where excavations are carried to a specified depth, or where the supporting strength of the soil is low, it becomes necessary to shore the trench walls. This may be done in several ways. One of the oldest is by using sheet piling which is driven down as the work progresses. A more common method is to place planks against either wall and hold them in place with trench jacks. This method allows more flexibility in installing and removing the bracing material.

Excavations in streets are subject to flooding with surface rains unless properly dyked. Keeping the water out of a trench or manhole excavation not only saves the expense of pumping out the water, but prevents the danger of caving when the walls become wet, or in some cases, electrical shock.

Nearly every job of manhole and duct construction calls for the cutting of street paving. If hand tools are used, two essential precautions are taken. (1) A man holding the drill must use tongs. (2) He should wear goggles to protect his eyes from flying materials.

On larger jobs compressed air drills are used. Here the risk of injury from hand tools is not present but the hazard from flying particles is greater because the exhaust air blows the cuttings out of the drill hole. Goggles must therefore be worn by all workmen operating air drills.

Air compressors must be kept in perfect condition at all times, and under no circumstances should a home-made exhaust pipe be used on air compressors, due to carbon monoxide fumes entering air intake creating a dangerous hazard.

Some cities stand on rock or rocky ledges and it is necessary to blast for underground construction. Only experienced and cautious men should handle this work. The blasting should be carried out with as light shots as possible and each time the work should be thoroughly covered with mats made of brush or old steel cable. Guards must be placed in all directions to warn all persons while the charge is being placed and exploded. The handling of explosives is a specialized and hazardous work and must be placed in the hands of experts.

## Cable Installation

Manholes present quite different working conditions from those encountered in the open on the street. They are often only dark pockets where mud, water and gas collect to the inconvenience and hazard of the underground workman. Gas is the most dangerous because it is invisible, and sometimes odorless as carbon monoxide or natural gas—the former poisonous, the latter flammable.

Before entering manholes the workman should assure himself that no gas is present. Artificial gas, gasoline vapor and the like can be detected by the sense of smell. Some other gasses are odorless and can be detected only by the use of some special testing device.

The combustible gas indicator is used to measure flammable gas and vapor mixtures in air. It is satisfactory for use in artificial gas as well as natural gas, gasoline and oil vapors. These instruments should be handled only by an experienced man.

If gas is detected, it is well to know where it comes from, and necessary steps should be taken to correct this unsafe condition.

Where gas has been found, the manhole should be ventilated before entering, and ventilation should be continued while men are below to prevent any possibility of asphyxiation or an explosion. Simple ventilating devices or blowers may be used.

One of the most frequent minor accidents in underground work is the mashing of toes, or injuring of feet, while handling manhole covers.

Some companies use iron hooks, others use iron bars. Some companies require two men to lift off a cover by using an eye bolt which hooks through a hole in the casting. A bar is passed through the eye bolt, allowing the men to stand clear of the cover while lifting it.

The cover should be removed out of the working area where there is no possibility of it being tripped over or hit by vehicles.

Workmen must be required to always use ladders when entering a manhole. Ladders should be carefully inspected periodically and should never be painted.

A protective railing placed around an open hole prevents the workmen and public from accidentally stepping into the opening. It also



acts to warn the street traffic. The most common type of guard railing is made of pipe or tubing, and jointed for folding up when not in use. Some companies use guards made of angle iron, and other companies use folding, wood guards made of light material, and with a wider rail. These are more conspicuous warning devices.

Guard railings are usually painted red, amber, or black and white. This is usually more effective where there is a wide surface and the two colors can be shown in diagonal stripes.

Flags are commonly added to the guard railings. Lights are also effective in this work.

A careful foreman or superintendent plans the location of all equipment before starting to pull cables into ducts. Pedestrians should be barred from passing between the winch truck and the manhole, or between the cable reel and the other manhole. Trucks should not be placed where the exhaust gases fill the manhole and asphyxiate the workmen.

Cable reels are heavy and clumsy. Being round, they may get out of control. Workmen should exercise extreme care in handling them. Poor soil may allow a reel to tip off the jacks and injure workmen. Such hazards can be minimized by use of cable reel trailers, where possible. These should be protected by barriers at all times.

Sometimes considerable force is necessary in pulling cables into ducts. If the pulling line should break, a serious accident might result. For this reason, a dynamometer should be used for the heavy pulls, in order to know what strain is being put on the line and to keep below the danger point. Care must also be used in attaching the cable grips, for should they give way, the result will be similar to the breaking of the pulling line. A workman might be struck and injured, or the line might whip into an energized cable or piece of equipment. Keep men and public away from the line while it is under pulling tension.

Splicing takes time and requires many tools and materials. While the men below are engaged in their work, helpers should not lower anything without the attention of at least one man below. Hot solder must be lowered very cautiously. The same is true of hot compound; therefore use only good strong solder pots and compound kettles having a loop in the bail so that they cannot slip on the hand line.

The type of hooks used on hand lines must be carefully selected. One end carries a long hook, from which it is almost impossible for things to slip off. On the other end is a strong snap similar to those used on a lineman's safety belt. Sometimes sister hooks are employed.

Blow torches are about the only open flames used in manholes.

Where energized conductors or equipment must be handled the workmen should be required to wear rubber gloves. This rule necessitates the wearing of gloves when a supposedly de-energized cable is being cut, so as to reduce the possibility of an accident from cutting into the wrong cable or in case the wrong cable were de-energized. A greater hazard attaches to live work on the underground system than on the overhead due to the dampness of the surroundings and the better grounding conditions. Greater precautions must accordingly be taken.

Rubber gloves are reliable only when given careful attention. They should be purchased under rigid specifications and carefully tested before using. They should be handled with great care by the men to whom they are issued. Any glove which is damaged should be immediately returned to the laboratory for inspection.

As rubber gloves deteriorate rapidly, the gloves should be tested at frequent intervals (at least once a month) even though there may be no apparent need for so doing.

Rubber hose, blankets, hoods must be kept in perfect condition, laboratory tested before using and should be tested at regular intervals. Too much stress cannot be laid on the necessity for care and testing in the use of rubber goods.

Good lighting is important in obtaining good workmanship, and preventing accidents. Adequate lighting should be furnished all workmen.

The main hazard encountered in the handling, placing and connecting up of transformers and switchgear is the hazard commonly associated with handling heavy machinery, accentuated by the limitations in working space. Some of the frequent causes of accidents are (1) defective or slipping tackle at the time of lowering into manholes; (2) toes caught under rollers; (3)



caught between machine and wall; (4) struck by hand tools of fellow workmen; (5) strained while lifting; (6) tools dropped on man below in manhole.

Such accidents can be eliminated by having experienced foremen with an experienced crew on all such work. The crew should be trained together until they know what each can do in performing his work, and all safety precautions should be taken, such as the examining of all materials, the wearing of safety shoes, hard hats, instructing men how to lift properly and the proper training of all men in the use of safety appliances.

Maintenance and reconstruction work have more electrical hazards than any of the work so far discussed. The identification of circuits and the detection of voltage are hampered by the lead sheath of cables, while limited working space prevents escape from burns and flashes when circuits are shorted or accidently grounded.

The usual practice is to remove cables from service before working on them. This calls for a clearance from the dispatcher, or person responsible for the operation of the system. If there is an error in the description or designation of the circuit desired, there will be trouble when the workmen find the cable still energized.

To obtain a clearance, definite information must be given to make sure that the system operator and the foreman making the request for a clearance fully understand what is wanted. The essential data are—

(a) Full name of the person requesting the clearance.
(b) Date and hour of making the request.
(c) Description of circuit desired, circuit number, station from which it is fed and district fed.
(d) Time circuit is desired and duration of work.
(e) If hold-off protection is desired.
(f) Name of person in charge of the repair work.
(g) Name of the person who will terminate the clearance and hold-off.

This information should be written out in a "clearance book" by the foreman making the request. Before it is effective it must be checked, as the system operator repeats the message received. If correct, the system operator gives the clearance its serial number and tag, making it effective. After the circuit has been turned back for service, the foreman forwards to the system operator the clearance tag and copy of the written clearance. This is for the purpose of checking the correctness of the information and the care used in filling out the form and clearance tags.

Before starting work on the circuit it should be grounded at the station to prevent the possibility of its becoming accidentally energized. This requirement is rapidly becoming universal practice as it is the best insurance against possible trouble.

Whatever system of clearance and hold-offs is used, it should be simple and explicit, backed up by rigid enforcement. All cables should be properly marked for identification. Test lamps are simple and easy to use for testing secondary voltages. One should be used when necessary.

Sometimes it is necessary to do work on energized or hot cables. Underground workmen do not have the advantage of open work and wide clearances as in overhead construction. For this reason special precautions must be taken when doing any work on energized cables or switchgear.

Energized cables should not be heat or moved. The higher the voltage the greater the risk. The workman is so close to the cable, he has no chance to escape in case a fault should occur. If it is necessary to move a cable it should be de-energized before the work is started.

Every step in the making of a hot joint must be made cautiously and as much of the work as possible kept covered or insulated. A rubber mat insulates the workman from the lead sheaths of the other cables on the same rack. The lead of the cables being spliced is insulated by wrapping with rubber sheets. A rubber mat should be placed under the workman to insulate him from the floor.

Workmen should wear both gloves and goggles while soldering connectors and when filling the joint with compound.

Helpers should be trained to keep furnaces and hot solder well away from manhole openings. He should be allowed to lower hot solder to the splicer only on the latter's request and then only when the splicer stands clear and keeps his eyes on the pot.

Sometimes it is necessary to work around energized equipment. Every precaution for



covering up should be made in this instance. Rubber gloves and protectors must be worn for the protection of the men.

Manholes should be kept clean and carbon tetrachloride fire extinguishers should be kept handy to rush to underground fire. Manholes should be properly ventilated after a fire before workmen are allowed to enter. The gas from carbon tetrachloride will cause asphyxiation.

All rubber goods should be properly checked and cared for according to rules and regulations of American Society for Testing Materials.

The prone pressure method should be used for resuscitation. Each employee working near energized lines should be properly trained in first aid and should be an expert in giving artificial respiration, prone pressure method type.

Things that are important to remember in artificial respiration:

(1) Keep the victim lying down, head resting on hand, other hand over head.
(2) Keep the victim wrapped up.
(3) Keep breathing passage open.
(4) Keep proper rhythm, when changing operators never lose rhythm.

Each employee should be trained in first aid. Safety meetings should be conducted regularly. Each supervisor and foreman should be responsible for safety on his job, and the safety director should aid and assist the supervisor and foreman in their work.

There is one thing to remember always in safety, the more we study, the more we learn, and the more we learn, the more we should apply it to our everyday life. Remember, the life you save may be one of your own immediate family.

## A Brief History of the Baltimore Division of Disability Compensation

By ELMER F. BERNHARDT
Director, Division of Disability Compensation, Baltimore, Md.

The Division of Disability Compensation, through which all accidents involving municipal employees are handled, was organized pursuant to the provisions of Ordinance 55 and placed under the jurisdiction of the Comptroller (Department of Finance), effective February 1, 1940. Prior thereto, this important subject with its many ramifications was handled direct by municipal departments in a manner which did not adequately protect the City's interests.

Centralization was finally adopted after repeated recommendations relating thereto were made in the reports of the Central Payroll Bureau since 1926. Seven full time "on call" physicians replaced about fifty-six who were previously compensated on a fee basis, under which new arrangement the medical aspect of the subject was better co-ordinated notwithstanding a material saving which obviously resulted. These full time "on call" physicians were departmentally assigned on the basis of previous accident statistics (approximately 2,000 accidents per annum) and while the plan, which remained in effect until December 31, 1944, was manifestly better than the former "fee basis" arrangement, it did not provide for prompt medical service because in many instances the physicians were available only during their respective office hours.

Many cases were accordingly sent to hospitals for first aid treatment and then referred to the departmental physicians for subsequent treatment until medically discharged. This plan of operation proved to be not only an inconvenience to the injured but caused considerable loss of man hours, as well as confusion in the preparation of the case records.

Each of the seven physicians were required to execute certain forms relating to the State Industrial Accident Commission as well as to supply information concerning the status of the employees when able to resume duty or when finally discharged from medical care. In addition, an individual "history of medical treatment" was required maintained by the physicians for each case. These requirements were found to be burdensome unless the physician employed secretarial assistance, and as a result, reports were delayed.



On the other hand, centralization brought about more efficient procedures. Accident causes were carefully analyzed and a "cure" was effected in 1941 by the introduction of a comprehensive accident prevention program to which department and bureau heads magnificently responded. Safety committees were departmentally organized and a lecture room was provided where monthly meetings are regularly scheduled and presided over by a supervisor of safety.

Proceedings are recorded for distribution to the respective department or bureau head and to principal city officials. Periodic meetings are also held within the department machine shops, garages, yards, and wherever employees are assembled. Since 1941 the city's accident load has consistently decreased from 2,354 accidents to 1,488 in 1944. Decrease 866. Interesting statistics are in the process of preparation to determine the City's "severity" and "frequency" rates (National Safety Council formula) as applied to injured employees engaged in extra-hazardous work.

An aggressive campaign has also been instituted in reference to public liability and property damage claims on which insurance is carried. As a result thereof, a marked improvement has been effected beginning as of September 1944. On the other hand, the city is self-insured in respect to claims involving injured employees for which an annual appropriation is established in the Ordinance of Estimates (budget)—$35,-000.00.

Reduction of the accident load correspondingly reduced the need for the seven full-time "on call" physicians and because the system followed, as heretofore explained, was found expensive as well as cumbersome, an Accident Clinic was established at 202 Guilford Avenue on January 2, 1945. The entire first floor of this building now houses the Division of Disability Compensation.

Medical treatment is rendered 51 hours per week from Monday to Saturday, inclusive (8:30 a.m. to 5:00 p.m.) by two "Clinic Physicians" who are assigned four and one-fourth hours each per day, and a registered nurse is regularly in attendance. The administrative routines are handled by a supervisor, an assistant, and two receptionists (A.M. and P.M.) whereas the accident prevention program is carried on by a supervisor of safety, a stenographer, and a statistician in an office which immediately adjoins the safety lecture room. In addition, a chauffeur-porter is employed for the purpose of transporting convalescent patients to and from the clinic and to maintain it in a clean and tidy manner.

The clinic equipment, which is of modern design, includes a Picker Mobile X-Ray Unit with fluoroscopic attachment, examining tables and chairs, water and instrument sterilizers, orthopedic tables, a refrigerator for biologicals, instrument cabinets, infra-red ray units, and a supply of clinic requisites embracing a variety of medications, adhesives, bandage, cotton, sutures, etc. A splendid developing room is provided for X-ray film processing and four "recovery rooms" have been established for patients who are in shock or who require heat or massage treatment.

In the latter part of April, 1945, uniform regulations were promulgated, and revised forms were issued to approximately 550 department and bureau heads, school principals, foremen, and other supervisory forces, in which manner uniformity of procedure was assured. The Central Bureau of Investigation, a division of the Law Department, continues the investigational phase of the Disability Compensation procedure."

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# Safety in Its Application to Highway Construction

By J. E. P. DARRELL
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For a number of years some highway departments and many industrial organizations have had established safety programs for the prevention of accidents among their employees. Very few of these programs have effectively covered construction projects for highway improvements. In most cases it is assumed that a few signs or flags are all that are needed. Various types of warnings and barricades usually are erected at the ends of a project, but all too frequently they are hastily thrown together of such materials as are available and often are ineffective and confusing. Having "stuck up" the warnings or a few flags, the engineer or the contractor assumes that he has met his full responsibility for safety.



The application of safety measures in highway construction falls into one or more of three principal categories. First is the *safety of the employee* as affected by his tools or equipment and his attitudes. Then there is the *responsibility to the public* to see that adequate warnings are maintained, that signs, barricades and other devices are so located and maintained as to guide traffic through or around the work area with a minimum of hazard and confusion. The third phase or category is the *protection of the employee from the carelessness or recklessness of the public.*

A very large proportion of present day road construction consists of the rebuilding and resurfacing of existing major highways. Unfortunately it is not always possible to route traffic entirely away from the job, but rather it must be carried over the job or immediately adjacent to it on temporary roadways. With rapid increases in traffic volumes the handling of traffic around or over the job poses greater problems.

Responsibility for the job itself and for the safety precautions taken on the job cannot be divided. It is one responsibility. Neither the contractor nor the engineer can avoid this responsibility. It certainly is the duty of the engineer to see that the job is done properly even though the plans or special provisions might require the contractor to make the necessary installations.

It might be well to be a little more specific with regard to safety in highway construction and to mention some of the factors to be considered under the three categories referred to previously.

1. *Employee safety program*—Any successful safety program must start with the personnel employed on the job. There are special problems, however, in setting up programs for safety educational work among construction employees. Unlike many other types of work where employees can be trained over a considerable period of time and usually continue indefinitely on the same job, highway construction projects are most frequently of comparatively short duration. Thus by the time a crew is trained the project is completed and the contractor moves on to a new job, perhaps in an entirely different area where he must start his training program over again with a substantially new group of employees.

The only way that this problem can be solved is through the constant alertness of the permanent supervisory employees to insure that operations are carried on with due regard to safety rules and that all employees are properly instructed in the correct and approved methods of doing their work. While the burden for employee instruction must rest with the supervisory personnel from superintendent on down, we must recognize the fact that such a program must have the full support and encouragement of top management.

2. *Safety of the traveling public*—In many types of construction operations the public can be entirely excluded from the construction area. This is rarely true on highway construction work. Even where detours are provided and through traffic can be routed around the work it is usually necessary to provide means for local traffic to be carried over or adjacent to the operations to reach their homes or other destinations along the job.

The way the traveling public is treated has a considerable bearing on public reaction or public opinion with regard to road construction as well as the good will towards highway contractors and highway departments.

If it is necessary to carry traffic over a job during construction operations the safety and protection of the public should be the number one consideration. The person who must travel over the work is entitled to be adequately warned and guided so that his passage will be accomplished safely and with as little inconvenience as possible. False warnings should be avoided. Warning signs must be removed whenever the situation they are intended to warn against does not exist.

Flagmen should be alert and courteous. Flagmen should be used more frequently than they have been in the past.

Barricades and signs should be kept in good condition. Messages must be easily read and understood. The adequate lighting or reflectorization of warnings is important. A driver is much more likely to become



confused at night when visibility is reduced than he is during daylight hours when he can see what is beyond or behind the sign.

3. *Protection from reckless drivers*—If there is an effective safety program in the organization, if the contractor's employees are properly trained to do their work safely, if because of this training they have a better safety attitude, and also if proper use is made of flagmen, signs, warnings, barricades and full consideration is given to the motorist who must use the road during the progress of the work, the protection of the worker from the reckless or careless motorists will be less of a problem. Observations and checks have shown that the public reacts rather favorably to the efforts of those responsible for the proper conduct of construction work to practice safety and to give the motorist true and clear warnings of what they may expect.

In conclusion let me emphasize the need for safety programs in the highway construction field. I do feel that we have largely sidestepped this important field of accident prevention and that if we apply the same kind of effort to the elimination of accidents in highway construction that we have used in other safety activities we can achieve equally successful results.

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# Safety in Water Main Construction

By WENDELL R. LaDUE
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Safety—or shall we say accident prevention—in water main construction is no different in application from safety in other industrial or construction fields. Hence for our present purpose this talk might well be in the nature of a discussion of safety methods in the over-all utility field rather than a too detailed summarization of "good practices" with most of which all of us are familiar.

However, for the moment, in approaching the stated scope of this paper let us ask ourselves a leading question—what items constitute the safety or accident prevention problems in water main construction? For the sake of clarity we will outline first only the physical hazards and processes leaving to our further efforts the tasks of fitting our safety program to them as we see it in our given utility. In so doing the following will, of necessity, be a scheduling process:

A. *Excavation:*

1. Pavement breaking — flying chips, thrashing broken air hose.
2. Machine excavation—boom clearance, dropping of boom or bucket by mechanical weakness or tampering with controls.
3. Hand excavation—loosening boulders from side of trench, dropping them in removal from trench. Running material with possible cave-in.
4. Trench sheeting—inadequate or loose bracing and shoring.
5. Truck loading—faulty spotting and spilling of material during loading.

B. *Pipe Handling and Laying:*

1. Loading, storing and unloading pipe. Unsafe slings and hooks, inadequate blocking permitting rolling on truck, in storage or along the street.
2. Lowering pipe—unsafe slings and frame. Inadequate grip when using machine for lowering pipe. Improper signalling.
3. Laying pipe—carelessness in centering pipe and placing blocking. Cramped quarters. Improper cutting technique.
4. Jointing—careless handling of hot material, top trench side and at joint. Insufficient care in pouring "wet" joints.

C. *Backfilling:*

1. Unloading trucks—faulty spotting and faulty dumping. Lack of inspection of material.
2. Tamping—danger in working around pipe.
3. Removal and cutting of sheeting—danger from running sand and loosened boulders. Dull axes.



D. *Barricades and Lights:*

1. Inadequate lights and barricades of open trenches. Faulty temporary surfacing.
2. Inadequate lighting on trucks, especially during emergency operations.

In all the above one thing seems to stand out—familiarity with a repetitive job, its tools, its materials, and its processes, leads to contempt for known sources of danger and thus to consequent accidents. Please pardon reference to just a few Akron, Ohio, observations:

1. Emergency trucks should be equipped with warning lights on both front and rear. These are to be blinker lights at normal heights so installed to blink continuously while on the job.

2. For handling pipe use cable drop forged hooks. A frayed cable may be seen while a weakened link in a chain sling will pass unnoticed. Periodic tests should be made.

3. Accidents, regrettable as they may be, can be great teachers to the workmen.

4. Cooperation with men on the job employed by the other utilities pay dividends in our own organization. They are very willing to protect their poles, pipes and conduits if given only the opportunity, thus relieving our safety program to that extent. In this the team-work principle is evident.

We cannot consider safety with full regard to the utility workers only. What of the public? Yes, we say casually that they are protected by barricades and lights and by safe operation of equipment on the public streets. But what of provision for their protection from potential dangers surrounding various water works structures?

Nearly all water utilities have elevated storage tanks, reservoirs and electric pumping stations located within the city, these are often on the same grounds with recreational or playground sites. What of a safety program tailored to apply to those using this area—especially to children? Special reference is made to such items as:

a. Tank towers—in spite of all normal protection, teen-agers will climb the towers to paint high school symbols and football scores on the tank, for all to see—especially the opposition.

b. Fenced-in transformers, unless roofed over with a fine screen provide an ever-present safety hazard where adjacent to a baseball field.

c. High-tension wires and transformers on poles are always potential challenges for climbing.

The public, especially the children, must be educated to and become aware of these hazards as part of the utility's safety program.

So much for the tangible, plainly evident features of the water utility safety program.

Now I should like to think with you concerning the *real* underlying problem.

Safety may be defined as freedom from danger or hazard; an accident is a happening without design; carelessness implies a want of pains or thought of actions and lack of concern about the consequences thereof; heedlessness assumes the dismissal of the consequences of an act wholly from consideration.

Fundamentally carelessness and heedlessness—whether of management or worker—result in accidents harmful to both worker and management. Therefore a safety program should be so designed as to promote freedom from danger or hazards by securing reduction in those accidents caused by both management's or worker's carelessness or heedlessness.

Accidents due to poor lighting, bad human relations or inadequate enforcement of safety rules are now generally attributable to carelessness on the part of the worker, but might well be classed as due to heedlessness of management.

Safety rests with management—and I include top management—and management's responsibility for safety cannot be sloughed off onto the insurance company. Management—at *all* levels—must show a wholesome and sincere interest in the safety program. It must by precept, action and example cooperate actively with the workers in the safety program. To sound-off with "Be Careful" and then classify each accident as "Carelessness" will not do. Management must have a *continuing* policy of showing the worker *how* to be careful. The active backing of the safety consultant—or director, or expert, or what have you—by top management is essential. Without it any safety program is lost and meaningless.



Safety may result either from improving working conditions and processes or by improving human behavior. The means to these ends are *correctives* to remove hazards, *controls* to minimize exposure to hazards, and *influences* to encourage workers to avoid practices that are unsafe.

Management, and especially the personnel assigned to carry on the safety program, must recognize the various factors entering into human behavior—the personal characteristics, the wants, the ideals, the interests, the passions, and the illusions of each worker. No two are alike. Failure to recognize these elements places an unnecessary burden upon any safety program.

While a safety program is essentially a job function, the off-the-job phase of the program must not be neglected. This is a legitimate extension of management's right and obligation to keep the workers on the job. The extent of the worker-management relationship prevailing in the individual organization will determine the extent to which off-the-job activities may affect the safety of that organization. All personnel administrators recognize the beneficial effects of off-the-job safety, especially in the field of human behavior.

A successful safety program requires active cooperation between management (at all levels) and the workers. This implies that an active, intelligent, cooperative management-worker relationship exists in the utility. Without this a safety program sponsored by management is lost.

In a general sense, and to a marked degree the man assigned to carry-out a safety program is a moderator between management and workers. In a small organization he may well be selected from either management or from the workers, depending upon his personal traits and duty requirements in the organization. In larger organizations a personnel man may be engaged for the specific purpose. The carrying out of the safety program is thus made a controlling part of his duties.

The director of the safety program must be free to meet with management—including the top executive—to discuss policies openly, render decisions on policy and approve expenditures for safety construction. On the side of the workers, he should consult with the safety committees on a give and take basis concerning what should be done and what the workers consider necessary—or as the case may well be—unnecessary. Members of these safety committes should be, in general, drawn from the workers group and not from the foremen or minor supervisors who are usually classified as workers rather than management. The personnel of these committees should change frequently—with a maximum term of one year.

Beside the personal contacts with the workers, a program of speakers, movies, posters and spirited but friendly interposters and spirited but friendly inter-section contests with safety as a background are essential in keeping the idea of safety uppermost in the minds of both management and worker.

In spite of the best safety program, accidents—"happenings without design"—will occur. It has been said:

> "History repeats itself.
> The unexpected always happens.
> Therefore, how incapable is man of profiting by his past experience."

Is this an indictment or a sentence? Nevertheless, we in safety work do not have to be reminded as to how true this can be. Accidents of a similar nature will be repeated again and again, while employees strive to "live and learn."

The first thought in any safety program is accident *prevention*. This involves four fundamental activities:

1. Removal of physical accident hazards (a function of management).
2. Study of processes and practices (a function of both management and worker).
3. Education to minimize human hazards (a function of the worker).
4. Investigation of *every* accident whether injuries result or not (a function of both the worker and management).

Summing up it is evident that accident prevention is practically a 50-50 proposition —i.e. cooperative effort—between management and worker.

An important phase of a safety program is accident investigations. A thorough program of such activities involves the following:

1. Investigation by at least two persons neither of whom is under the supervision of the head of the department in which the accident occurred. Obviously in a small organization this calls for an extremely diplomatic investigation.
2. The investigator should have a working knowledge of the equipment and processes involved in the accident. Consequently, the same investigators cannot cover adequately the entire field of the water utility. The safety director should be free to call on any worker, or supervisor, to act as an investigator.
3. The investigators should have good common sense and be capable of clear thinking to enable them to carry the investigation to a fair, unbiased conclusion with a definite recommendation.
4. Since an accident usually involves both a physical hazard and an unsafe act of human behavior, both should be weighed in the investigation.
5. Promptness is essential. Time dulls not only the physical aspects of the accident, but also the memory of those involved. Note the practice of *immediate* reports of the air force on their return from a bombing expedition in the late war.

A thorough and complete record of investigation of *every* accident will build up a fund of information—case data, if you please—on accident prevention.

The foreman on a job may readily argue that his responsibility ends when rules of safe practice have been made clear to operatives, and that he cannot consistently be held accountable for surreptitious infractions of the rules. Yet it is, nevertheless, an established fact that the supervisor has failed in his safety duties if the men under his direction have not been sufficiently impressed by instructions to willingly observe the precautions taken for their own safety.

We make no effort to discount the individual responsibility of the worker for his own safety and that of his fellow workers. If an adequate set of rules of safe practices have been set up in the plant or on a job, the worker is primarily responsible for the results of their infraction. There is, however, no tenable alibi possible for the lax discipline which permits these infractions.

We are here more as management, than as workers. What can and should we do in regard to a safety program in the water utility or other operating field?

1. We should organize our personnel for safety and discipline ourselves into safety consciousness.
2. We should tighten up on our supervision for safety.
3. We should provide protective equipment for the workers and school them in its use.
4. We should correct known and obvious physical hazards in the system.
5. We should develop practices that are safe. If this be done, enforcement of safe practices will be easier.
6. We should educate the worker and instill in him a desire for safety. The water utility safety program should be coordinated with that of the gas, electric and telephone utilities in our city.



## Safety in Its Application to Sewer Construction

By EUGENE A. SCHMIDT
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Sewer construction in its various phases is generally recognized as an extremely hazardous occupation. When it is considered that rates for workmen's compensation insurance for this industry are second only to those charged for wrecking operations, and that for every dollar of labor used as much as fifteen cents must be added to cover the cost of such insurance, it will readily be seen that this industry is a fertile field for accident prevention measures.

Sewer construction is divided roughly into five major phases. These in the order of increasing hazard are (1) earth open-cut,



(2) rock open-cut, (3) non-pneumatic earth tunnelling, (4) pneumatic earth tunnelling and (5) rock tunnelling.

I want to discuss the advantages that a decreasing accident rate can and will have to (1) the sponsor, (2) the contractor, (3) the foreman and (4) the worker, and to discuss at the same time the responsibility that can and should be assumed by each to achieve the common purpose. However, in order to properly evaluate any benefits and fix responsibilities, I am now going to discuss the regulations under which sewer contractors operate in the State of Wisconsin and the City of Milwaukee. The regulations of Wisconsin may not be the best that can be devised, but they furnish a good criterion upon which to evaluate conditions in your community.

The Industrial Commission of Wisconsin is charged with, among other duties, I quote: "to administer and enforce all other laws protecting life, health, safety and welfare of employees in employment and places of employment, etc.," also, "to adopt reasonable and proper rules and regulations relative to the exercise of its powers." Accordingly, the Industrial Commission has promulgated the "General Orders on Tunnel, Caisson and trench construction."

These General Orders are the results of the work of a committee composed of representatives of the Industrial Commission, labor, contractors, medicine, engineers, and insurance companies. The scope of these orders is, I quote again, "These orders shall apply to all tunnels, caissons, accessory shafts and trenches while under construction with the exception of tunnel construction in connection with mines."

These Orders, in brief, prescribe in an extremely comprehensive manner the minimum safety measures required to protect workmen and the public against hazards from cave-in, fire, blasting, storage of explosives, use of equipment, improper sanitation and ventilation along with minimum medical requirements.

In open-cut work the minimum trench timbering requirements are prescribed under varying conditions such as, depth, width, type of ground and proximity of previous trenches. In tunnels the minimum dimensions of timbers used and the various types of timber sets and their limiting dimensions are prescribed. The constructor chooses the type of timbering set to suit the ground conditions and the dimensions of the finished sewer.

The types of timbering and their limitations described are the box type, modified box, hexagonal, arched 6-piece set, cap and leg type and the arched 5-piece set and some modifications thereof. In pneumatic tunneling the Orders prescribe hours of work, periods of compression and de-compression together with special safety and medical requirements.

The City of Milwaukee, as part of its specifications, requires that its contractors adhere strictly to the provisions of the General Orders. I have often heard the General Orders criticized by contractors who contend that they do not allow the competent engineer or contractor enough opportunity to show his initiative.

My answer is that the general orders were designed to protect workmen and the public against incompetent contractors and that the statement in the General Orders, I quote, "any other method of supporting the walls of an excavation will be approved if designed and constructed to afford equivalent protection," give him the opportunity to present his method for approval.

The Industrial Commission is also charged with the operation and enforcement of the Workmen's Compensation Act of Wisconsin. The act requires that all employers (except farmers) who usually employ three or more persons must come under the act. The amounts of compensation for permanent injuries and for lost time due to industrial accidents are fixed by the commission. The commission also fixes the rates of insurance, each industry having a basic rate per dollar of payroll.

This rate changes each year and is based on the average amount of compensation paid out in the first three years of the four years immediately preceding the year in question plus not more than twenty-eight per cent divided by the total payroll of that industry in the entire State. I emphasize the words "entire State" because I will refer to it later in this talk.

As I said before, the insurance rates for the sewer construction industry are relatively high. Rates for 1948 for four of the five general classifications of sewer work per



$100 of payroll are, earth open-cut $5.75, rock open-cut, about $8.25, non-pneumatic tunneling $11.25, pneumatic tunneling $14.00. There is no established rate for rock-tunneling; each project is given a rate according to the conditions of the job.

These are base rates. The contractor has some individual control over these rates. After a contractor has been in business for five years or has paid a premium of $800 in any one year or $400 for two years he is qualified and is given a credit or debit rating depending on his safety record. If his record is above the average he receives a credit rating of a percentage of the base rate. Conversely if his record is below average.

Theoretically a contractor with a perfect record can get a credit rating of approximately seventy per cent of base rates while the careless contractor's debit can be infinite. Incidently I have heard of one case (not in the sewer construction field) of a contractor having a sixty-nine per cent credit and of another with a ninety-nine per cent debit. Of the group of approximately fifteen contractors bidding on work in the City of Milwaukee, the spread is from a credit of 18 per cent to a debit of 4 per cent, with the majority being on the credit side.

The sponsor of sewer projects has a definite stake in safety. In the final analysis he or we are paying for all of the costs of the contractor plus his profit. At the present time the City of Milwaukee is doing about two million dollars worth of sewer construction per year. A reduction of one dollar in the insurance rate would set us about ten thousand dollars, assuming labor as fifty per cent of the cost of a project.

The contractor very definitely will profit from increased safety. In our State, from my explanation of the operation of the Workman's Compensation Act, it is evident that the contractor with the highest insurance credit has a very definite bidding advantage over his competitor on the debit side. His crews are more efficient because they are not continually being riddled by injuries. The safe contractor, other things being equal, usually has his pick of men.

It has been my experience that the most successful contractor is the one who is most interested in the safety of his men. Likewise, the foreman who is careless with the bodies and lives of his workers will soon be so unpopular with his men that it will be difficult for him to hold his crew. At the present time men are independent because they know skilled help is at a premium and consequently they will not work under more adverse circumstances than prevail on other jobs.

I do not believe that any program of safety in the sewer construction industry can be successful without a comprehensive set of regulations. It cannot be self-regulated because of the uncertain nature of the industry. Most sewer contractors are gamblers to a certain extent. They must be, because it is difficult to foretell with any degree of certainty the nature of the soil conditions that may be encountered.

Variable and changing soils are the rule rather than the exception in the glaciated parts of our country. I have seen a tunnel being driven through the finest kind of clay, suddenly encounter quick sand so fluid that operations had to be shut down and airlocks installed before progress could be resumed.

Because sewer contractors are gamblers when they bid a job they are all too prone to gamble on adequate timbering, which may be adequate for the visible ground conditions but do not allow for those that may be a few feet or inches on either side. Therefore a set of regulations similar to Wisconsin's General Orders is indispensable in any safety program, and if your state or community does not have such a guide the first order of business is to have one established, preferable on a state-wide basis.

You will unquestionably run into opposition from contractors and contractor groups who are loathe to relinquish any of their independence. Enlist the help of more reputable contractors, showing them the advantages I have tried to enumerate. Enlist the help of the labor groups at the higher levels; they can and will be of tremendous assistance. Because many labor groups use their welfare fund to supplement the compensation that an injured worker receives, they are most anxious to further such legislation.

I think that I can truthfully say that organized labor was most responsible for the passage of the Industrial Commission Law and the Workmen's Compensation Laws in Wisconsin. Such a regulatory act, statute or ordinance must establish *minimum* re-



quirements and must have sufficient "teeth" in it to provide for adequate enforcement. It cannot be expected that the regulatory body will be able to provide sufficient enforcement; therefore all of us who are in responsible charge of sewer construction projects must see to it that the safety provisions are carried out within our jurisdiction.

In Wisconsin the Industrial Commission furnishes one man to supervise the Orders. He also is charged with the enforcement of all mining regulations, so you can readily see that, without help from us, he could not begin to cover the necessary ground. The Bureau of Sewers of the City of Milwaukee, and the Metropolitan Sewerage Commission, a semi-autonomous body, which operates the treatment plant and builds or supervises the construction of sewers within the remainder of the County of Milwaukee, enforce the Orders vigilantly.

However, I know that enforcement in the rest of the State, especially the smaller communities, is woefully inadequate. I know that the rate of insurance for workmen's compensation is unjustly high in our city because of the influence of this lack of supervision in the smaller communities, because, as I told you before, the rate for the industry is fixed by the Commission on a state-wide basis.

I feel that this condition is not deliberate, but is due *largely to* the ignorance of officials and engineers of their responsibility. However, city and community officials cannot be blamed for some conditions of the industry more or less beyond their control. Much sewer work is done by plumbers and sewer contractors as private contracts on private property. Usually they "get away with murder" as far as adherence to the Orders on such work because there is no strict supervision of that type of work.

I venture to say that injuries from "cave-in" on plumber's ditches outnumber those on public contracts in the City of Milwaukee by ten to one, and I can only wonder why the ratio is not greater. I have seen men working in a plumber's ditch, ten or twelve feet deep without a stick of timber. "Rat holing," which is tunnelling without the use of timbering, is also prevalent although strictly forbidden by the Orders.

Education must play an important part in any safety program and particularly in one pertaining to sewer construction. On the average, the sewer worker, I believe, is of lower caliber than those in most industries. Insurance companies have instituted safety schools for industry at large, but I believe that instruction should be more specific and the worker should be instructed also in the hazards peculiar to his occupation. I am sure that most public officials recognize that safety pays and that, they as sponsors of sewer construction projects must "carry the load" in educating contractors and their workers.

We, in Milwaukee, have been most fortunate in having a progressive Contractor's Association. Last winter, in co-operation with Local 113, Laborers and Hod Carrier's Union A.F.L., this Association sponsored a foreman's school. Two superintendents represented the contractors, and I was asked to present the side of the Bureau of Sewers, City of Milwaukee.

About half of the course was spent in discussing the application of the General Orders and safe sewer construction practices. I was gratified to see marked improvement not only in the quality of the work produced, but our continual hammering on safety produced excellent results. We hope next winter to continue these classes and expand them to take in the rank and file of workers.

In conclusion I want to enumerate again the steps to accomplish safety: (1) Have enacted a set of minimum rules and regulations, (2) put "teeth" in the enforcement of these rules, (3) make these rules a part of specifications so that the contractor has no alternative but to obey them, (4) Sponsors and engineers shall help to enforce the rules, (5) educate contractors and (6) educate the workers.

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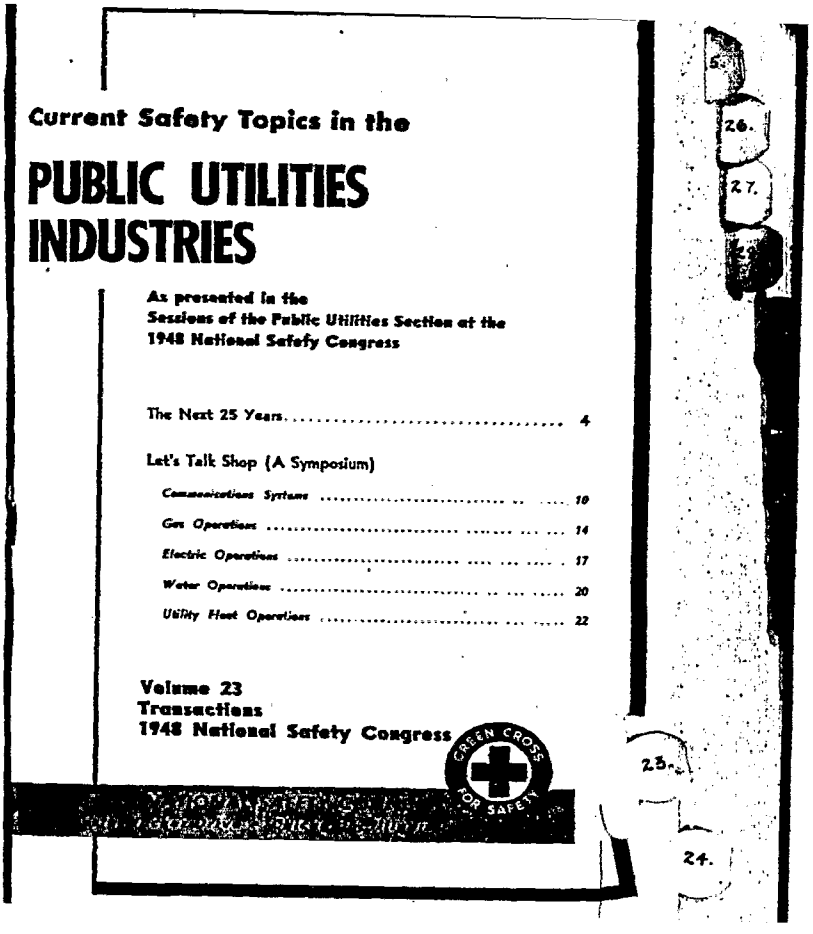
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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE PUBLIC UTILITIES SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Public Utilities Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Public Utilities Section carries on in behalf of its members, and for the benefit of accident prevention work in the utilities industries generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of public utilities. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on pages 26 and 27 of this volume.



# The Next 25 Years

By K. R. MACKINNON
President, Ebasco International Corporation, New York, N. Y.

"Why worry about the next 25 years?" you may ask, "What we need is action *now* to stop the accidents that are occurring every day. Take care of today and the future will take care of itself."

The reason for discussing what may happen in the next 25 years is because accidents follow definite trends. Only by reviewing the past can we predict what is going to happen in the future and determine how our efforts should be directed.

Today, in the year 1948, accident prevention is a recognized function of good management. There are very few utility companies which do not carry on safety work as part of their normal functions.

Perhaps you do not realize that 25 years ago we could not have made that statement. Although many utility companies were carrying on safety work at that time, a great many more were doing little or nothing. It was not until 1926 that any effort was made to find out how many fatal and disabling injuries were occurring in the electric industry. During that year statistics were collected for 1923, 1924 and 1925, and have been collected every year since.

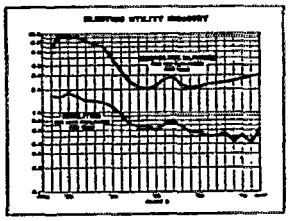
The gas industry started collecting statistics in 1919 and has made them public since 1929. Accident records for the Bell Telephone Companies as a group run back to 1922.

I would like to compare the results of the various units of the Public Utilities Section for the good we can all get out of it. The electric, gas and telephone companies have worked together to mutual advantage on such matters as conduit and pole line locations in streets and highways and other joint construction problems. They can profit even more by a continual exchange of experience in accident prevention.

When electric utility statistics were first assembled in 1926 many safety men were surprised to find how regular they were. They thought that with so many different kinds of companies, types of plants, programs of construction, etc., there would be wide variations in the number of accidents occurring. It was found that the fatal accidents per thousand employees for the years 1923-25, for all reporting companies, ran 1.68, 1.60, 1.80.

The publication of those figures caused some serious thinking in the industry. They showed that over four hundred men were being killed every year while engaged in their normal activities. What could be done about it?

What was done about it is shown in the curves of accidents for the period 1923-1947. *(Chart 1)*



The top curve is the number of disabling injuries per 100 employees per year for the electric utility industry. From 1926 until 1933 the rate dropped rapidly. It showed no further improvement until 1939, and has been climbing steadily ever since.

The bottom curve shows fatalities per 1,000 employees per year. This rate also dropped rapidly between 1926 and 1933, less rapidly since then, but fairly steadily downwards until 1946.

The net result indicated by this fatal accident curve is a saving of about 300 lives per year in 1946 compared with 1926 —a splendid record, but it still left over 100 fatals per year to work on.

In 1947 something went wrong; fatal accidents jumped from 108 to 173, an increase of 60 per cent. The Accident Prevention Committee of the Edison Electric Institute is busy trying to figure out what happened and I am sure if they analyse the problem diligently they will find the answer. What we want to make sure of is that 1947 is not indicative of a change of trend. That curve must be made to turn down, not up.



Looking back over the years and reviewing the safety work done, a number of items come to mind which have been helpful in bringing the accident record to its present level.

Improvements in design; safety activities on construction jobs; getting operating men interested in safety, as an *operating* problem; stressing of foreman responsibility; development of company rule books; increased use of rubber protective devices; company safety committee; organized safety departments; company, regional and national competition, increased committee activities on national and regional scales; increased executive interest and a somewhat greater feeling of responsibility for accidents; job analysis—practiced in recent years by some companies but still being done on a meager scale.

Great improvements have taken place in practices of grounding, hold-offs, use of rubber protection, etc. Improvements have been made in the design of structures and apparatus. We are now protecting lives through mechanical means to a degree not thought of 25 years ago. The August issue of *Electric Light and Power* carried a striking article on this subject by W. T. Rogers of Ebasco Services.

However, in spite of this progress in reducing fatal accidents, the steady increase in disabling injuries would lead us to believe that the electric utility industry has not been getting at the real *fundamental bases of accident prevention*. We have been coasting along, perhaps a little too satisfied with the results of our fatal accident prevention work, satisfied with even the slow rate of reduction in recent years, and not realizing that the lost-time curve was flagging us a warning. *Now* in 1947 the fatals go up. How do we know we have not struck bottom there, as the other curve did in 1934? How do we know it is not going to turn definitely upwards?

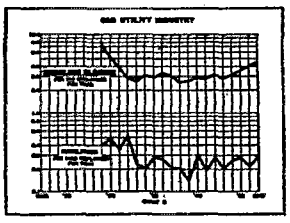
What are the fundamental bases of industrial accident prevention?

1. Every position of authority in an organization carries with it the responsibility that goes with the job. To a large extent top management in the electric utilities have held their safety departments responsible for accident prevention when that responsibility is a function of the operating organization, headed up by the president and general manager. The duties of a safety director are those of a staff officer—to advise, inspect, coordinate, prepare and give impetus to plans. It is the duty of the line organization to carry out the plans.

2. A *safe* way can be found for every operation needed in our business. It is the duty of top management to see that the work is done the safe way. When I was a youngster I was told many times that "there is a right and a wrong way to do everything." That is true of every type of operation in our industry, but we have not begun to put down on paper what the right ways are, and follow this up by seeing that each operation is done the right way.

We can go just so far by the methods we have been using, together with all the inspirational efforts that tend to create a safety consciousness among employees, but as individuals are permitted to use individual judgment on methods of doing work, especially in hazardous situations, I am afraid we may be on the up-grade in accidents of all kinds.

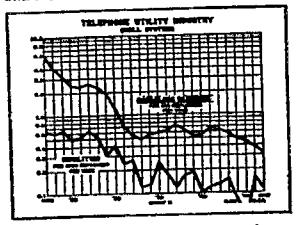
These remarks apply equally to the gas industry. Let us take a look at their rates from 1929 to 1947, the period during which statistics have been published. *(Chart 2)*.



*Note the similarity to the electric curves*—the increase in disabling injuries since 1932; the lack of any improvement in the fatality rate since 1932. The fatal rate was actually higher in 1947 than in 1932.



Now let us look at the telephone industry. *Chart 3* shows disabling injury and fatal



rates for 1942-47 for male plant employees in the Bell System operating companies. Note the similarity of the disabling injury curve to that of the electric from 1922 to 1933, except that the telephone rate fell much more rapidly than the electric.

But since 1941 there is an entirely different story. While the electric and gas show steady increases, the telephone curve has gone steadily down. The fatal curve also shows a steady decreasing trend, but at a much lower level than the electric.

Now, let us look at comparative curves of disabling injuries for all three industries on *Chart 4*. The telephone people had as many accidents as the electric had in 1922, but now look at them! Look at the trends since 1939—electric and gas going steadily *up* while the telephone keeps going *down*.

True, there may be greater hazards in the electric and gas industries tending to cause *fatal* accidents, but when you eliminate electric shock cases from both the electric and telephone records you find that the electric have more than twice as many fatals per thousand as the telephone. Telephone men are subject to fully as many hazards—such as falls from poles and ladders, automobile accidents, manhole explosions, drowning, etc., as the electric, yet, for those types of accidents they have more than twice as good a fatal record. Why?

At this point let me say that all these charts are average figures. Some telephone companies' results are substantially better than others. Some power and gas companies are also substantially better than others, and the better ones may compare favorably with the telephone figures.

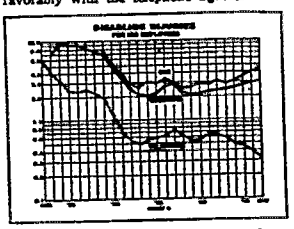


*Chart 4* is a record of the general run of lost-time accidents such as slips and falls, automobile collisions, injuries from tools, falling objects, etc. I don't think electric and gas men are subject to any more of those types of hazard than the telephone men are, but their records respectively are about 10 to 14 times as bad. Why?

Of course, all comparisons between industries, as between different companies, are open to criticism. Perhaps there may be differences in the care taken to get men back to work to avoid reportable accidents. That occurs in many companies in all industries, especially when they are entered in safety contests. In any event, it can't have a great effect on a national scale. Remember the telephone record shown is for *male plant employees*. It is not diluted by counting the girls in the traffic department. The electric and gas figures are for *all* employees.

What do the telephone people do that the others are failing to do to make such a record? Records like that do not occur by chance.

You remember how the girls are supposed to have written during the war to their boy friends overseas, "What have those foreign girls got that we don't have?" The answer was, "Nothing dear, but they have it here!" Well, I'm not so sure that the telephone fellows do not have something that the others do not have, and they have it here.

For one thing, the Bell companies have centralized supervision and standardized practices. Because of this they can obtain much greater uniformity in safe practices



than either of the other utilities. In the Bell system a line truck and a service wagon in Maine are equipped exactly like their counterparts in Florida or Texas. They have job analysis worked out to a fine point—there is a right and a wrong way to do everything and they teach their men the *right* way—*one* right way which is adopted as a standard throughout the country.

A second feature of Bell Telephone operations is their training courses for supervisors. These are operating courses, primarily designed to teach men to do their operating and maintenance work most efficiently. They have developed into safety courses. These courses comprise:

1. *Vocational instructor training*, in which supervisors are taught how to teach their men. We all know that the best way to learn a subject thoroughly is to teach it to somebody else.

2. *Human relations*, in which supervisors are taught how to win and maintain the cooperation of their men on the job.

3. *Planning supervisory jobs*, in which the supervisors are taught how to plan their work and carry out their supervisory responsibilities.

A third feature of Bell Telephone operations, which again stems from centralized supervision, is executive interest in accident prevision. When a head office, such as the A.T.&T. headquarters in New York, is thoroughly sold on safety, it can have a great effect on the interest maintained by executives of subsidiary companies.

Now, I did not come here just to sing the glories of the telephone industry. They are quite capable of telling the world how good they are without my help, and how well they do it! But we electric and gas men are trying to solve our problem, which we have seen to be getting worse instead of better, and we should take full advantage of what our telephone brethren are doing and see to what extent we can use their ideas.

Since the passage of the Holding Company Act of 1935, the electric and gas industries corporately have been almost completely disintegrated. We have lost whatever centralized supervision we had, and can never recover the benefits that flow from unified direction and control. We can, however, make full use of all the ideas we can pick up at this Congress, and put them to work in our own companies.

### This Neurotic Age

What are we to do to reverse the trend and pull those curves *down*? They are certainly not going to turn down of their own accord. The natural trend is bound to be *up*.

We must remember that 25 years ago life was a lot less exacting than it is today; the pace was slower; automobiles were much slower in speed, and less powerful—much less plentiful.

There were no transcontinental airways, no national broadcasting, no sound movies, no sound trucks, and no television. Life was comparatively quiet. Now we have reached the atomic age. Our nerves, shattered by two world wars, have to run a daily barrage of jarring impacts, including the fears of World War III.

Our bodies and our mental processes are very much as they were hundreds of years ago, but due to the speed-up of our type of living they have to withstand shocks day after day for which nature has not equipped them. Little wonder that 50 per cent of our hospital beds are filled with mental cases, and one marriage out of three is ending in the divorce courts. This airplane—television—atomic age has made us a nation of neurotics, and today the great cry among the medical profession is for more psychiatrists to keep us all from ending up in mental hospitals.

Now where is this all going to lead to in the next 25 years? There does not appear to be much chance of slowing down our activities. This year our air force has announced with great pride that planes have been built which *fly* faster than sound. Where do we go from here? To greater and still greater speeds? Life has indeed become a war of nerves.

This is not the place to spend our time speculating on where the world is heading, but we can do some serious thinking about the effect of the increased pace of living on our accident trends. What can we do to head off the rising record of accidents that faces us in this speed-crazy atomic age. From the trend of those curves it is apparent that unless we make some fundamental changes in our methods, it is going to be difficult to even hold the present line, let alone show any improvement.

It is fair to assume that what may be called mechanical improvements, which are



found in our best operated companies today, will become more generally used. These include improved design, interlocks and all sorts of equipment and devices which can be used to make operations safer. A number of years ago it was difficult to make a worker use goggles, and even ten years ago many companies did not compel electrical workers to wear rubber gloves when handling 2,300 volts hot.

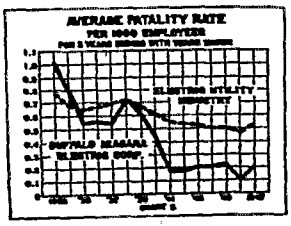
Surely those are standard practices today. Or are they? Even the safey engineers of our industry have not agreed on a standard practice as to *where* a lineman should put on his rubber gloves—at the foot of the pole or within four feet of the energized conductors? Surely we have had enough accidents so that we can determine the safe practice for such a simple operation!

What, then, must we in the electric and gas industries do to turn those curves down?

First in importance is *executive interest.* While I have never yet seen an operating company president who did not *say* he was interested in accident prevention, I have met comparatively few who actually work at it. Many executives make a speech at the annual safety banquet, hand out diplomas to first-aid teams, then settle back and let the safety director and safety committees look after the actual work for another twelve months. They may call in their top men when some exceptionally bad accident has occurred, raise hell all around and say, "This sort of thing has to stop!" Then they become immersed in operating details and do little or nothing until next time.

We speak of "executive interest" in accident prevention as if it were something the safety director should plead for. Safety men of the industry frequently act as if they look upon accident prevention as *their* responsibility, and they ask for *cooperation* from top management, instead of trying to show that management where *their* duty lies and pointing out what *they* (the executives) should do about it.

Many of you, no doubt, have read the address of Mr. A. T. O'Neill, president of the Buffalo Niagara Electric Corporation, before the EEI Convention at Atlantic City last June. Here is a chief executive who really works at accident prevention every day of the year. Results of his efforts are shown in *Chart 5.*




### Job Analysis

*Next in importance* in our things to do is to develop job analysis on a major scale. You safety men talk about it as "on the job safety" but we all know that safety should start *before* the job. We should have handbooks for every type of work, and should discuss the hazards of each job before it is tackled. To many boys have gone to their death because the foreman said "Let's go, boys," without explaining in detail how the job was done or making sure that he and his men understood the hazards.

Job analysis is a major job for you operating men. As an example of the extent to which job analysis can be developed, the Bell System has a 35-page pamphlet on Extension Ladders. That seems a lot of detail to put out about *ladders,* but just remember those accident figures—one-tenth of the electric—one-fourteenth of the gas. *It pays off,* and *pays off big!*

### Training Programs

The third big job in the years ahead is for all companies to develop sound training programs. Many of our companies have schools for linemen where apprentices learn the rudiments of distribution work. Some companies have training classes for foremen. But industry wide, our training program is *in a primitive state.*

We have always had a lot to *say* about the foreman in accident prevention work. We have expected a great deal from him, frequently without too much backing from those in authority above him. We expect him to have remarkable qualities of leadership and yet do comparatively little to develop them.



The qualities of leadership which make a good foreman are hard to describe, but they may perhaps be best grouped under the word "personality." A *good* foreman in every sense of the word is a real person. We all know the "tough guy" type who can show his authority only by barking orders and bawling out his subordinates. We want none of that type. We need leadership in its highest sense, and a foreman who would be a real leader must not only know the technical details of his work, but must also be both a student of human nature and a natural psychologist. He must be able to analyze his men and understand their moods, and in this neurotic world most of us have our moods, our fears and our phobias.

How often have we seen accidents for which there seemed no possible reason—frequently to some worker who is known for his interest in safety. How many of these accidents were caused by blackouts due to emotional upsets we shall never know, but I venture to say there are many of them. We are learning a good deal nowadays about the mental conflicts that entirely normal people frequently go through—caused by unhappiness at home, feeling of a lack of security, or perhaps some deep seated neurosis acquired in youth. While we cannot expect our foremen to be able to get to the bottom of these neuroses, that being the job of a psychologist or a psychiatrist, they should learn to know when they see them. They should understand the emotions of their men and be close enough to them to know when they should not be allowed to work in hazardous positions.

Not only must foremen study their men, but superintendents must study the foremen to see that they too are free from neurotic tendencies which make them—and through them, their men—accident-prone.

And while the *superintendents* are checking the foremen, who will do the checking on the superintendents? We must be sure that they too are schooled in safe operating methods and in human relations. They must have a full and penetrating awareness of their responsibilities. It ought to be easier for them to become safety conscious than it is for our managers and presidents. They are closer to the accidents and to the men who are injured, but they too should receive from their supervisors both guidance and assistance.

Safety directors should not be afraid to give advice to their supervisors right up to top management, even though it is not popular. Their chief executives are no doubt interested in safety, or think they are. It is the safety director's job to show the boss how he can turn that interest into effective work in preventing accidents. Officials in line of authority must learn to accept their full responsibility for accidents, and the higher the official, the greater the responsibility.

I think the reason so few top executives get really stirred up about it is due to the fact that they seldom, if ever, get to the scene of an accident and actually see what happens to a man who is killed or permanently injured because of improper operating methods, or because somebody blundered. If the chief executive attended the funerals as the safety director does, he might some times wonder what he might have done to have saved those lives.

This program is one for *all hands* to work on. If we put in effect these ideas we have been considering, on a nation-wide basis, I feel sure that we shall soon see a marked drop in our accident curves. The *trend should then be permanently down.*

## Let's Talk Shop
## (Practical Plans for Puzzling Problems)

**(A Symposium)**

*Discussion Leader:* E. S. Beaumont, Safety Director, Peoples Gas, Light, & Coke Co., Chicago.

*Participants:*

**Communications Systems.**
E. Dalton, Supervisor of Safety Practices, American Telephone & Telegraph Co., New York City.

**Gas Operations.**
W. F. Brown, Safety Director, Consolidated Edison Co. of New York, Inc., New York City.



**Electric Operations.**

D. C. STEWART, Safety Supervisor, Niagara Hudson Power Corp., Buffalo, N. Y.

**Water Operations.**

HAROLD F. WEBB, General Safety Director, The West Penn Electric Co., Inc., Pittsburgh, Pa.

**Utility Fleet Operations.**

A. J. NAQUIN, Safety Counselor, New Orleans Public Service, Inc., New Orleans, La.

CHAIRMAN BEAUMONT: To begin our "Let's Talk Shop" symposium, we have Mr. Edward Dalton who will talk on communications systems.

### Communications Systems

MR. E. DALTON: Since I am going to talk about the communications industry, any facts or figures that I present today will deal specifically with that part of the industry that is engaged in handling communications. They do not include the experience of companies engaged in the manufacture of equipment used by the industry.

Now in looking over the records, we find that not all organizations engaged in the industry report their injury experience to the National Safety Council. In 1947, for instance, only 67 units reported to the Safety Council, and as was brought out here during the Tuesday meeting, the frequency rate for the industry for those 67 units amounted to 2.98, and the severity rate amounted to .16.

The injury rate for this particular industry is low, comparatively speaking.

Now since the rates for the industry as a whole were not available, I have taken the liberty of reviewing for you the injury experience in the Bell system. This experience is representative of the industry in general.

As you know, the figures in *Accident Facts*, published by the National Safety Council, are predominantly those of the Bell system.

I should like to call your attention to this particular chart. You will note that after an upward trend in 1941, the course to the end of 1947 has been consistently downward. In the past four years the industry has established a new low, and this has been accomplished during the past two years when the system has increased its total number of male plant employees from 85,000 to 150,000, or a net increase of 65,000 people.

This has been done by giving special emphasis to job planning, to training and supervision, and I think it demonstrates again that attention to these activities can be used successfully to overcome inexperience in the force.

You will note at the bottom of that chart that fatalities were listed. On the average, we had 12 for each of the periods of 8 years shown. In 1945 we completed the year with but three, and of these three cases, two were due to motor vehicle accidents and one was due to a fall. All of those three cases happened in the last two months of the year, and they terminated a period of 13 months and 10 days in the industry without a fatal accident.

In comparing the frequency rates for the first eight months of this year, we find there has been a slight upward trend. This trend for the eight months shows an increase of approximately 11 per cent over the same period for 1947.

In going back over the records, although we have established this new low in the past four years, we were not thoroughly satisfied with the results obtained. You see, we're hard to satisfy when it comes to the prevention of injury to our personnel. This trend has disturbed us slightly, but I'm sure that it can be overcome.

While we cannot relax our attention to the impersonal factors, we must not forget that only 20 per cent of our accidents are caused by them, but we are particularly concerned about the other 80 per cent that are caused by the personal factors involving man and his will to do, and that is why I say we are not thoroughly satisfied with the rates obtained during the past four years, because we feel that the things that caused those accidents are within our control, and they can be corrected.

I should like to present two or three particular problems in which the industry is engaged, and which are giving us concern at this particular time.

The first problem that I wish to present deals with the operation of motor vehicles. The growth in the number of telephone company vehicles to meet the demand of the business, together with increased traffic on the highways, byways and roads of this nation, has increased our motor vehicle accident prevention problem.



Now our problem is not confined specifically to the operation of motor vehicles on the highway. It involves other things such as the operation of auxiliary equipment used with the motor vehicle, equipment such as pole derricks, winches, wire take-up reels and pole-hole diggers. It also involves the operation of tractors of various types, and the use of wire and cable plows and trailers.

About 25 per cent of our fatal cases during the past 8 years have occurred due to motor vehicle accidents. Many of us, of course, have been less serious, but 25 per cent of our fatal cases have been the result of motor vehicle accidents.

Now an analysis of these cases shows that very few of them are due to mechanical failure or faulty design of the equipment. The great majority of them have been due to errors on the part of personnel operating that equipment.

Now safe driving courses by fleet owners have been offered by various universities throughout the country. Many of the companies in the industry have taken advantage of those courses, and many have developed courses of their own. Since our problem deals with the driving of motor vehicles on the highway, plus the operation of auxiliary equipment, our responsibilities are therefore two-fold. We are confronted with the task of preparing, training and supervising large numbers of employees so that they may become skillful drivers, and then, of course, there is the matter of developing and maintaining interest and proper attitude.

How do we do the job necessary to cut down on these motor vehicle accidents? Now some of the companies, as I mentioned a moment ago, have been doing quite a bit on how to cut those things down. The Illinois Bell Company has been doing quite a lot, and I should like to ask at this particular time if Mr. R. H. Meyers of that company would tell us what they are doing in his company to offset these motor vehicle accidents.

MR. R. H. MEYERS [Illinois Bell Telephone Company]:

Following the close of World War II, realizing that we would be confronted with an increase in inexperienced employees and a tremendous increase in motor vehicle use, we immediately concentrated on further development of a driver training course. We wanted all of our employees mindful of the responsibilities that they would be confronted with in properly handling motor vehicles and also that they might have the proper attitude in recognizing accident-producing situations.

Mr. Dalton mentioned some of the sources, such as the American Automobile Association, Penn State College, the National Safety Council and Purdue University. Our material was from these sources, and consequently we had eight of our employees in the Purdue motor vehicle training course in 1947.

We concentrated this effort by group meetings, pointing to safe habits in the operation of motor vehicles, the subjects being "Knowing Your Vehicle," "Safety Margins," "Braking Distances," "Reaction Time," "Last But Not Least," "Courtesy"—meaning, "What is good public relations?" and so forth.

I don't know that we are in a position today to say or to point to any specific savings resulting from this program, but we certainly believe that we are going to reap benefits, not only to the company, the employee and his family, but to the communities in which we operate.

MR. DALTON: The second problem that I would like to present at this time deals with supervisory training. As I mentioned only a moment ago, the growth in number of employees—that is, male plant employees in the system—has practically doubled itself in the last two years. Now the increase in personnel has resulted in additional line construction units being formed, in new field engineering gangs, in central office groups and others. Obviously, the appointment of many new supervisors has been necessary.

Supervisors need training, and they need experience, because in the hands of the supervisor is the key to safety. These people must be able to train their men. They must be able to detect and correct unsafe habits and procedures and practices of the people they supervise. Supervisors must be properly trained, and they must be developed to handle this task.

Special tools have been used and can be used in connection with this task. These



tools are in the form of training courses, such as vocational instructor training, human relations training, and job planning.

Vocational instructor training enables the supervisor to train his people on the job, to do the job correctly, efficiently and safely.

Human relations is a supervisory tool which enables the supervisor to win and maintain the willing cooperation of his people on the job. This can be a positive factor in the prevention of accidents.

Job planning enables the supervisor to become more proficient in planning the discharge of his supervisory responsibilities, of which safety—I think we will all agree—is one of the most important.

The tremendous expansion program in the system may possibly result in pressure upon supervisors to get the job done, to meet service dates. In this desire, training of the supervisor may be neglected.

All supervisors require training, not only the newly appointed ones but those who have been with us and who must be trained to meet changing conditions. Our objective is to provide a type of supervisory training which will meet the present day needs of the business.

In this connection some of the companies in the industry have been doing a good job on that. Some have just entered into that phase of the job, perhaps in greater detail than in the past.

The Michigan Bell Telephone Company has been doing something along those lines very recently, and George Dennison of that company has been engaged in that activity. I'd like to call upon George to tell us what they have been doing in his company.

MR. GEORGE DENNISON [Michigan Bell Telephone Company]: We don't pride ourselves that we are at the present time one of the best. Your figures would indicate that, if you showed a breakdown. I think the significant point in connection with the job that we have had in the past few years has been the terrific increase in the number of new employees, as Mr. Dalton mentioned, which obviously necessitates a terrific increase in the number of supervisors, and that's where the big job starts.

In the Michigan company, in the past two years, our force has increased from about 3,000 employees to over 8,000, and that necessitated a proportionate number of new supervisors. We have used some of the courses that Mr. Dalton mentioned.

Mr. Dalton mentioned the vocational instructor training, human relations and job planning. We have been engaged in some of them for a number of years. The job planning course is a little more recent as a program, and is a separate course for each individual craft.

We also have a course known as basic management. The Bell representatives will probably recognize that as the so called package, that covered all aspects of the supervisory job, and that has been broken down, subsequently, into separate individual courses.

We have been providing a conference leadership course for all supervisors—second line and above—to enable them to conduct more effectively the conferences they have to hold. There is another course for first-line supervisors in conducting the meetings which they are required to hold with their employees.

We have provided an orientation course which each new supervisor gets as quickly as possible after his appointment, and this acquaints him with the other crafts and other departmental jobs, so he is in a little better position to know who he is dealing with and what their responsibilities are. It is a "get acquainted" course, and it takes several days.

The most recent course that we have developed for supervisors is specifically a safety and supervision course. This course takes the safety problem apart and lays it on the table to let everybody see what it is and what can be done about it. Actually, it is a wonderful arrangement for putting into practical use this human relations course, which is a psychological approach to human reaction, motivation, and so forth, and in this safety course we can make practical use of that rather heavy psychological subject. And there is indication that it is being very well received by the supervisory people.

MR. DALTON: The third problem that I would like to present today is one in which the industry is vitally concerned at this time, and it deals with the safety of our personnel who have occasion to work in underground conduit systems.

This problem involves the proper procedures in connection with testing and ventilating manholes. Prior to 1929, the industry had a very limited means of testing and ventilating manholes, consequently there were large numbers of accident cases resulting from gas in those underground systems.



Realizing at that time the need for improving the situation, the development of equipment got under way. Means of determining the presence of gas were found, tools for ventilating contaminated manholes were produced, and instructions were issued. The use of testing and ventilating equipment, together with better training and better supervision, reduced the number of accidents in manholes to about one-tenth of the number involved with gas prior to 1929.

Fortunately, there has not been a fatal case resulting from gas in manholes since 1937, during which year we had four. However, since the first of this year, injuries due to gas in manholes have given us considerable concern. There have been reported no less than ten serious gas cases. Seven of these ten resulted in lost time injuries. Of course, there were others less serious in nature. It is most fortunate that of the ten we had no fatal cases.

Analysis of these cases revealed many significant points. For example, natural gas was involved in seven of those ten cases. In six of these seven cases where natural gas was involved, the personnel affected had made no tests, or made the wrong test. No forced ventilation was used in five of those seven cases, and of the ten, the great majority of them were due to explosions in the hole.

Now it is important that you keep in mind at this time that these ten cases, in all probability, could have been avoided by proper use of the equipment we now have at hand and by following recommended procedures.

The question that arises in our mind is this: Have our testing and ventilating methods failed to keep pace with the changing conditions encountered, or is it a simple question of doing a better training job and getting better employee acceptance of our present procedures?

Some of our companies have been doing some work in this connection, because it is a vital question at this time. The Wisconsin Bell Telephone Company has been engaged in some work in recent months, and I think George Cunningham, former safety supervisor of that company, can tell us briefly what they have been doing in the Wisconsin company to avoid these gas cases.

MR. GEORGE CUNNINGHAM [Wisconsin Bell Telephone Co.]: This problem is not new, but in the last couple of years we have added a great deal to our underground planning. We are doing a lot more underground work. We are making splices in holes with greater frequency than we have ever done before. In other words, our exposure is greater. That, coupled with recent changes in the gas industry—with the introduction of different mixtures—seems to give us some trouble.

We do know that about 7½ per cent of our manholes right now are either dangerous from the standpoint of the atmosphere or approaching the danger point, either from an explosive or a poisonous standpoint.

What we have done about it is this: Certainly we must explore the possibilities of improving our testing equipment, and that is what we are engaged in at the present time. I think we can look forward and expect some improvement to make the equipment perhaps a little more reliable, somewhat more durable, and simple enough so that the average man can use it effectively. As I say, I think we can look forward to some improvement in our methods.

As far as ventilating is concerned, we have not been able to come up with a better answer than the one we have had for some time. There was some discussion as to the comparative effectiveness of drawing the air from the manhole or blowing fresh air, air which we know is uncontaminated, into the hole. We have found—and we feel quite confident about it—that blowing fresh air into the manhole is by far the most effective means.

For that we use the standard Bell System blower, and the smallest one which we use has a capacity of 650 cubic feet per minute. We feel quite confident that regardless of the condition we find in the manhole, if we use this blower for 10 minutes before the man enters, and continuously while he is there, he will be perfectly safe. However, we must train our personnel so that every time they enter a manhole, they carry on the prescribed tests.

We are doing that not by any special training course but, as we approach most of



our problems, right down through the line of organization. Where we have been successful in that, we have been keeping our men very safe.

QUESTION: I'd like to know how they determine the test to apply to a manhole. Do they wait until they have an accident? For instance, you mentioned that seven out of ten had natural gas in them. How did you know the natural gas was in there, and did your test equipment provide a test for natural gas?

MR. CUNNINGHAM: It doesn't make a great deal of difference to the man what kind of gas is in there. What is important is whether it is poisonous, explosive, or dangerous.

An oxygen deficient condition has given us no particular trouble, because we make a routine test of deeper manholes—over nine feet in depth—and these are the only holes that have given us any trouble in oxygen deficiency. We so mark those holes.

As far as the other tests are concerned, we test for a poisonous gas, and then we test for an explosive gas. We do the same thing in either case, if the test shows that the atmosphere is dangerous.

MR. A. E. ALLEN [Public Service of New Jersey]: In the matter of testing holes, you would find gases, but how would you find oxygen deficiency?

MR. DALTON: In connection with the test for oxygen deficiency, we do have what is known as a suction gas indicator. A sample of air from the hole is taken into a lamp that has a flame in it, if the air in that hole is deficient in oxygen, the flame will gradually go out.

MR. ALLEN: So you use that on every hole?

MR. DALTON: We do not use it on every hole. We first make tests for the presence of carbon monoxide. If carbon monoxide is present, then of course we go into ventilation, and when ventilation is started, your oxygen deficiency is automatically eliminated. Now the three problems that I presented here today—motor vehicle operation, training the supervisor, and testing and ventilating the manholes—are three of our important problems, and not by any means all of them, but it is the answer to those problems and similar ones that will determine what our record will be in the future.

## Gas Operations

MR. WILLIAM BROWN: Those of you who attended the Tuesday afternoon session will remember the charts that were presented by Mr. MacKinnon, which showed the record of the gas, electric and telephone industries. I regret to say that the gas industry is on top, but in the reverse position. They are not on top in low accident rates but in high accident rates.

At the end of 1947 there were 153,000 employees in the gas industry. That was approximately 20,000 more than we had in 1946 and about 15,000 more than we had in the peak period of 1941. You can see that it is a growing industry, not quite to the same extent as the telephone, probably, or the electrical industry, but still growing, and like the other industries, I think the accident record somewhat reflects the growing pains of our industry, and also—as in the other utilities industries—we are having great difficulty in meeting the unexpected post-war demand for service.

In 1947 the gas industry reached an 18-year high in the frequency of lost time accidents, with a rate of 22. That is an astronomical figure in comparison with the rates you have just seen. The gas utilities industry ranks 30th among the corresponding rates of 40 major industries in 1947—an increase from 20th place in 1946. The higher severity rate of 1.25 ranked 22nd compared with 18th in the previous years, so we have lost ground on both frequency and severity.

Both natural and manufactured gas frequency rates are back where they were about 20 years ago, although the natural gas rates are somewhat lower than the manufactured or mixed gas operations.

In 1947 the death rate for 1,000 employees was .24, which compares unfavorably with the 1946 figure.

A few months ago Mr. Stewart, of the panel, compiled a review and classification of 166 fatal accidents for the gas industry. Some of you may have seen this tabulation. I'll just hold it up so you can get a look at it. It covers a nine-year period, from 1938 to 1946, inclusive—166 deaths in the gas industry. If we add the 34 deaths that occurred in '47, we have around 200 deaths in the ten year period of the past decade.

Ninety-three per cent of the total deaths occurred in production, transmission and distribution. Eighty per cent were from explosions, automotive, automotive vehicles, burns, falls, and suffocation by gas.



Most of the one-line descriptions that you find on these charts suggest their own remedies, and many, if not all, would have been prevented if the employee involved had stopped to safety-analyze the job at hand.

I wrote to a number of people in the industry, asking them to let me have their ideas and opinions and suggestions as to what they thought would be the outstanding problems in the gas industry. I am very much embarrassed because I got so many replies, and so many really sound replies. Apparently there are so many things wrong and so that it is impossible for me to include them in this brief time. There are a few that I have selected.

One is the explosion in underground distribution systems, attributable to leakage of mains carrying LP gases in mixture with air. A recent explosion at Winchester, Virginia, resulted in the cessation of the underground distribution of gas in that community and has eliminated a series of destructive accidents attributable to leakage of mains carrying LP gases in mixture with air.

There is reason to believe that internally such mixtures may be quite destructive to mains, because of corrosion that is not inhibited by condensing tar or oil films, and because of the high pressure of the oxygen. This problem is receiving very careful attention of the corrosion committee of the technical section of the American Gas Association at this time.

With the decentralization of communities, the increasing distribution of high pressure gases, and the advancing age of underground piping systems, the protection of premises against the invasion of leakages from outside underground mains and surfaces must become increasingly acute. Fortunately, natural gas is not toxic, per se, but the ordinary types may present undesirable corrosion problems.

Both manufactured and natural gas present a serious fire and explosion hazard. Preventive measures include a construction routine that will provide free release of such leakage before it reaches the premises, and the adequate ventilation of closed spaces in proximity to main surfaces.

The complete sealing of underground structures against gas invasion, in so far as that may be possible, should be studied. Gas companies appear to have a direct responsibility for systematic leakage surveys, for minimizing corrosion, and for providing free outside release of leakage by blocking access through foundation openings for services.

A third problem is the dissemination of adequate technical knowledge of the properties of gas, gas-making materials and processes, particularly as this knowledge leads to a prevention of accidents. In other words, I think that it is about time we face facts and stop playing the ostrich act. We should start to tell our troubles and exchange ideas on our problems. There is a need for widespread dissemination of adequate technical knowledge on the properties of gas, gas-making materials and processes, particularly as this knowledge leads to the prevention of accidents.

Thorough in-training service training of employees in the fundamentals of the scientific and engineering phases of accident prevention is a cardinal need. There is also needed some widespread publicity, setting forth such information in simple terms for the layman, to insure intelligent cooperation by the general public.

We have had some explosions in tar handling processes. Here are some of the suggestions that were presented at the recent meeting of the Accident Prevention Committee. There are five steps:

First is isolation of hazardous operations of a routine character involving combustibles. For example, operations that may accidentally release large quantities of combustibles to cause major fires or explosions should be isolated from the many ignition hazards ordinarily found in normal activities.

Second, reduction of exposure to personnel. In accordance with well recognized principles for the minimization of potential personnel losses, unnecessary exposure of personnel should be avoided by placing change houses in non-hazardous locations.

Third, positive elimination of hazardous conditions or hazardous additions; accidental change of process conditions that may needlessly make a non-hazardous operation hazardous. For example, the unnecessary addition of oxygen to a combustible gas mixture, or the unnecessary addition of heat to a



light oil should be made impossible by positive action. Thus the air entry should be blocked off, or the steam line should be *removed, as the case may be.* Where safety is involved, dependency upon manual valve settings should be avoided.

Fourth, instrumentation. Accidental change of process conditions that may create hazards should be policed by adequate instrumentation. Proper operation of such instrument guards should be insured by frequent inspection and tests.

Keep in mind that we are not criticizing anyone. We are not picking out any particular plant or operation or explosion, but merely citing five definite recommendations for the prevention of explosions in tar processing plants.

Fifth, adequate technical analysis of potentially hazardous operations. Operations presenting hazards should be given close scrutiny at competent and responsible technical levels, with the following objectives in view.

The development of an adequate understanding of all of the potential hazards, and the analysis of the suggested safety measures to insure that they are correct and effective today. They may have been correct and effective five years ago, but are they correct and effective today?

Most of our correspondence included the matter of safety education, and, like all other industries, the indoctrination of new employees.

In gas production new employees need to be trained to develop skills in handling material and all of the necessary tools required on the job. The new employee must be trained to recognize unsafe acts and unsafe situations. For example, in water gas fire cleaning, he must be taught to assume a safe position to avoid flarebacks. He must be shown how to avoid clinkers and coke spillage until it is cleaned up. He must be trained to wear proper clothing when cleaning wash pots, and observe the "no smoking" *rule in this operation.* When emptying and cleaning purifier boxes, he must be trained in the safe use of materials. We should observe the safe spacing of men and how to handle the digging bucket safely. The employee must be taught, how to pull manhole covers; how to dig excavations; how to place tools away from the lip of an excavation or trench; how to barricade and many other things vital to his own safety and the safety of the public.

The record shows that the new and inexperienced workers are contributing materially to the high frequency rates, which is to be expected. The record also shows that it is often the experienced worker, the old-timer, who is most often seriously injured or killed. This is also to be expected, since we assign the old-timer to the most hazardous jobs. It is important that the experienced worker be given every possible consideration in order to make better headway in our fight to stop this adverse trend in the accidents of the gas industry.

In the training, retraining and inspiration of the experienced worker there is a strong need for subtle checking. You have to do it subtly in order to avoid hurting his feelings. Make sure that he is following hold-off rules, particularly when opening steam or gas lines; that he is actually tagging and locking valves; that he is testing the blowdown for trip pressure; that he is keeping to the windward in producer charge operations; and that he remembers always that he can't eat gas.

When a foreman is burdened with new men to train, he will frequently assign an experienced man to do a certain job, but the foreman usually expects the same rate of production. He feels he does not have to instruct the experienced man, and he therefore allows him to use his own judgment on more and more important phases of the work. This sometimes develops a tendency in the experienced man to waive the rules and safe practices as he thinks necessary, in order to catch up or expedite the work.

The differences between a good foreman and a poor one may be his attitude toward safety. We can no longer charge off costly delays, tremendous wastes and human destruction to employee carelessness and let it stop there. An organized and clear-cut program is needed to assist the foreman to get the safety information across to his men. This problem is aided by rainy day meetings, where various motivating materials, factors, safety graphs, motion pictures, slide machines and many other things may be used, which you people already know very well.

A regular monthly trench-side chat on the more frequent types of accidents is of great value.



Finally, an observance of the working characteristics of the men by the foreman will tip him off to the unsafe working practices of his men.

There are many problems facing the top management of the gas utilities today. There is the problem of stopping the rising curve of industrial accidents, and the resultant higher operating costs and lower net profits is one which must not be neglected or passed over lightly.

We must train the new employee to take his place in the plant, and at the same time recognize that it is the skilled employee, with long service, who is being killed.

CHAIRMAN BEAUMONT: (Reading questions from cards submitted to the panel). What aids can the safety department provide the supervisor to assist him in the safety training of employees?

MEMBER: We can give them periodically the up-to-date story on what his accident problem is on his job, so that he can carry on his 15-minute or 20-minute boiler-side chat or trench-side chat with his gang and not have to flounder around to think up what kind of material he is going to tell his men to help them do a safe job. We can supply them with the material for these short talks to the men.

MR. A. E. O'CONNOR [Consolidated Edison Co. of N. Y.]: When a new man is brought into the industry, he is presumed to be a man of almost no experience whatsoever. He is given instruction from the ground up; in other words, the assumption is that he knows absolutely nothing at all. We assume he never used a hammer before.

He is taken to the particular department in which he is going to operate, and there he is interviewed by one of the men who is going to work with him.

First of all, he is given the necessary training in resuscitation, the prone pressure method. He is then given the book of rules, and after his physical examination and so on, he is sent out into the field, and from that point on he is on an "on trial" period. That period consists of 90 days, during which time he can be summarily dismissed. He is taken on with the understanding that he must qualify within 90 days.

He is sent out with a foreman who will observe him very closely and keep a check chart on the manner in which he operates. When this "on trial" period is completed, he is then called in and told how he has progressed, whether or not he will eventually be a permanent employee.

If, during that period, it has been shown that he has not been a safe worker, one who may at some future time get into a very serious type of accident, then that will definitely work against the possibility of his being a permanent employee.

When that time is up, of course, he is advanced to the next grade, and he has the same problem all over again. That is the manner in which we handle our new employees.

MR. BROWN: I have another question on which I am going to ask help from the floor. How does propane gas affect the gas worker?

MR. ELDER [Pennsylvania State College]: The local gas company changed from watered gas to a propane gas, and we have had some violent explosions and some bad burns due to the different gas apparatus not being properly adjusted. If you have that trouble in your locality, be sure that you have the valves changed to conform with the new propane gas.

MR. BROWN: I am trying to get some information on the effect on the individual employee—from the inhalation or the absorption of it. Does anyone have any experience on that?

MR. KELSH [Consolidated Edison Co.]: As far as is known, it is generally the same effect as produced by the manufactured gas.

MR. BROWN: That was my idea, but we haven't had too much experience with it. We haven't been using too much LP gas. Those of you who have been using it to a greater extent or in greater concentration probably know more about it than I would.

CHAIRMAN BEAUMONT: Our next speaker will treat the electrical operation part of our discussion.

### Electric Operations

MR. D. C. STEWART: In the last (at least) seven or so years, 70 per cent of the fatal accidents in the electric utility industry have been due to electric shock and burns, and year after year that ratio has held—7 out of every 10 men.

Now I know that we have companies of all sizes represented here, and some of you men are undoubtedly from the smaller



companies, and you may say, "We don't have that kind of accident."

Now let me tell you something. There is about one electric shock and burn accident in every five million man hours of work in this industry. So if you work a million man hours a year, and you have gone through three or four years without a fatality of that type, don't be lulled into a false sense of security. Remember that ratio, and remember that where unsafe practices that lead to shock and burn exist, there, over a period of time, is where that type of accident strikes.

Now 7 out of 10 is a pretty big ratio. That leaves only 3 for all the other types of accidents, and falls, automobile accidents and being struck by falling objects, and so forth, go into those three.

There is another problem that towers over everything else. The thing that disturbs me, as I know it disturbs you, is that 20 years ago in this Section, the safety practices which would have prevented electric shock and burn accidents were discussed. They were brought out. Through all these intervening years we have been conscious of them, and unless we do something about it, twenty years from now this same Section will probably be discussing the same practices.

The only way that we learn about accidents is from experience. And why? Why are we not using these hundreds of millions, these billions of man hours of experience that have told us the story and are telling us the story?

It does seem sometimes as if we could write the epitaph over the grave of every one of these men—"He died in vain," because every one of them is trying to tell us a story so that the men who are coming along, the men who are alive and working in our industry today will be alive and working, tomorrow, and not joining this procession of thousands of men who have paid the price for unsafe practices that we know about.

Now let's take a look. What are these unsafe practices? Well, let's go back to the men who followed them and paid with their lives as a result of electric shock and burn.

I'm just going to pick out a few of the possibilities. Here is a fellow working up on the pole tops. Here are some of the incidents that occur: *Tying into lateral; reached up and touched metal. Handling shiv; touched metal handling shiv. Reached up and touched metal, handling shiv. Attaching lead and bracket to crossarm. Tightening nut, contacted primary. Hand contact—transferring circuit to new pole; pole to wire. Grasp it with hand; hand contact. Up there in the primary area, climbing to change arm; grasp brace in contact with lead to cut-off.*

What kind of stories do those tell? Were these fellows actually handling line wires, tie wires and what not? No, men wear gloves when they handle wires correctly. These men were up within reach of the primary wires, doing their work up there in the primary area where they thought, "It's okay; I can handle myself," but it wasn't.

Isn't it true that where men are within reach of primary wires, then gloves are a necessity? Shouldn't gloves be put on before they enter that primary area, and remain on every moment of the time they are up there, and come off only after the man has come out of the primary area?

I have just picked out a few examples, and they haven't been selected; they are picked out at random. There were 32 men last year who didn't wear their gloves in the primary area, and who also might have saved their lives in some of these cases had they covered the primary wires.

All right, let's take a look: *Untied the tie wire to permit pulling slack; contacted energized primary. Installing primary extension; elbow contacted conductor extending from clamp. Rearranging wires on pole; contacted connector on temporary lead. While removing pothead tops, contacted a live pothead stud.*

These are all authentic case histories. These contacts were made with the arms. All right, is it logical to say this: As long as men work up in the primary area, moving around, handling tie wires, with their arms within reach of energized primary conductors, or contacts going to be made eventually, are they going to be hurt? The stories say "Yes." Therefore, should linemen wear sleeves when they are in the primary area, within reach of energized wires? The stories say "Yes."

I know the rest of the story of your troubles in that respect. We have them, too. But here are facts. I'm not trying to interpret them, particularly, and say that you must go back and put sleeves on those linemen. The facts say, however, that linemen do make contacts with arms to energized conductors.

*Body contacts: Installing a series street light circuit; touched end of temporarily hanging primary wire with body. Transferring wiring to new pole; contacted end of energized lateral. Changing the transformer; strung against live primary, contacting it with his back.*

Did those wires have protection, rubber protection, on them? Is rubber protection an essential? Is rubber protection needed to cut down this list of 125 electric shock and burn accidents of last year—more than had occurred in any previous year from all types of fatal accidents that the industry has had?

This record says that rubber protective equipment must be applied to wires in the primary area, if linemen, taken in the aggregate, are to protect their lives. That's what the story tells.

Let's go on to another class of work. You have ground men on the ground; you have linemen on the ground. What's the story there? Well, here's a man who was tending a coil of wire, and the joint snagged on the arm. The wire contacted the primary on the pole, up above, but here was the man down below. Are rubber gloves essential to a man who is handling a coil of wire on the ground when the other end of the wire is in proximity with energized conductors? The record says that it is just as important for that ground man—or lineman—to have his rubber gloves on, because the primary can come down to him just as readily as it can to a man who makes a contact up on the pole.

Here's another type: In raising a creosoted pole, the pole touched the primary, energizing the truck. The man touched the derrick. Now that accident occurs year after year. It appears in the record. What are the safety practices for maneuvering a truck or setting a pole in and around energized conductors? The truck boom can conduct current down to the ground. Certain types of poles can conduct current down to the ground. There is a set of safe practices for that, and the record says that those safe practices must be adopted if this list is to be shrunk.

Now that isn't the only type of electric shock. These fellows are engaged in line work, but through this country we have electric stations being operated, and they contribute liberally to this list of fatalities.

What happens in stations?

The biggest single cause of accidents in stations is that men get out of the safe working area and get over into energized areas, and they do it again and again and again. Don't we have to overhaul our practices for restraining and keeping men in the safe working area and preventing them from getting into other areas?

Right up there in importance with that are the hold-off practies, the mark-up practices. That is where men go to work on equipment which is normally energized, but which is de-energized while they are working on it. We must set up procedures and practices that will insure that this equipment is dead, through proper sectionalizing, through proper testing, through proper grounding, so that when the men go on it, they can be assured that it is not energized. These practices, once set up and tested and found to be sound, must be as rigid as the laws of the Medes and the Persians, and as foolproof as it is possible for operating men, safety men, engineers to make them, because year after year, hold-off procedures break down, and men pay for it with their lives. Often innocent men pay for it with their lives, and surely some of the blame attaches to the fellows who set up the condition that made it possible.

Let me just quote one or two case histories from station work. *Left job, then returned. Forgot bus had been energized, and climbed into it.*

*Replacing transformer. Replaced fuse but climbed higher. Contacted lightning arrester lead.*

*Reconnecting station. Climbed pole top; contacted 24 kv line.*

*Cleaned oil switch compartment. Moved to other compartment, which was alive.*

*Moved from safe area toward live air break switch. Fell against it.*

*Cleaning and greasing disconnects; contacted live jaw of switch in next section.*

*Inspecting clips of line side disconnects; lined out and made a contact.*





*Working on dead oil circuit breaker when he contacted live terminals from an adjacent oil circuit breaker.*

*Replacing switch. Loosened tower ground clamp; shocked by induction.* You see, the time honored sequence of removing the ground lead was neglected. That wasn't the only time that has happened.

Out of this meeting a lot of men can be saved. We can go back to our jobs and with all the ingenuity at our command bring these safe practices that are needed into the industry.

How can it be done? I have tried to point out some of the things that need to be done, but how to do it? I'm going to be listening attentively. I hope that something will come from you people, you men who are out in the thick of it. I'll be listening, along with the rest of you, because I know that the men who come from my own company will agree with me that we haven't solved this problem by any means. I think we have made a little progress, but, look, we lost a man this year. Why? He had the primary covered, but he didn't cover the secondary. He got against the secondary. A plug stuck out through a line hose and he made a contact. Now he is gone. Men forget that the secondary and every other grounded object within the primary area can become a part of the circuit through their bodies, and it is just as essential that it be covered as it is that the primary itself be covered.

### Water Operations

MR. HAROLD WEBB: I happened to be down in Winchester, Virginia just two days after that very violent explosion that entirely destroyed a four-story building without any warning whatsoever.

They were using a propane distribution system, and that was obviously the cause of this terrific explosion. As I recall it, I think one or two were killed outright and about 19 or 20 were injured.

The Winchester Council met immediately after the explosion and, after some determination, they passed an ordinance ruling out propane gas in the entire city. The only way that this gas may be used now, as I understand it, is from cylinders.

The 70 water plants in which I direct safety activities are widely scattered over approximately 30 states in the United States, and the personnel of each is small—which, as might be suspected, presents a problem in so far as safety organization is concerned. The actual direction must be done by remote control, or else the safety director would be riding the saddle almost continuously. Therefore, safety committees have been established at each plant, and these committees are required to make monthly inspections of the physical properties and report their findings in the usual way to management.

These reports are forwarded to me for analysis and advice with regard to the correction of hazardous conditions. Likewise, all personal injury and public liability reports are forwarded for the same treatment.

In most cases water works plants, whether municipally operated or privately owned, are never extremely large companies. The largest companies we have in our group have a total of 70 men at Birmingham, Alabama.

You can see the futility of doing anything other than trying to operate that scattered group by the use of a safety committee system, which has worked out quite well.

It is more or less commonly believed that water works employees are not exposed to any great risks, and perhaps they are not, as compared with the dangers from exposure to major products of other public utilities such as gas and electricity.

The greatest danger that may be anticipated from our industry is exposure to drowning. In spite of the hundreds of tanks and reservoirs and basins used for storage purposes, and the necessity for working around river intakes, intake pipes and equipment, only one drowning has occurred on these 70 properties in 20 years.

While we are beset with the occurrence of commonly caused accidents, high on the category, so far as the water incidents are concerned, are trench cave-ins, lead explosions and material handling accidents.

I'm going to cite four typical cases that have occurred in the not too recent past but, nevertheless, are typical of the water works industry.

*Case No. 1.* An excavating contractor was employed to dig a trench 28 inches wide by 6½ feet deep by 650 feet in length, in an unimproved street.



A gasoline-powered trenching machine equipped with caterpillar drive as a means of locomotion was employed in making the cut through soil composed of heavy, cohesive clay, to a depth of six feet, at which depth a stratum of sandy loam was found.

Now I think most of you have the picture. The work plan called for the pipe gang to lay and join the pipe progressively, keeping at a reasonable distance from the machine.

Two 18-foot sections of cast iron bell spigot cement line pipe had been laid and caulked, and three laborers were trimming the bottom of the trench when a cave-in occurred.

Many conjectures and theories were presented by eye witnesses, composed of workmen and sidewalk superintendents. However, these amateur observers missed an important clue when they failed to notice a pile of unusual planks and trench jacks nearby. They hadn't been used. But what caused the banks to cave in? Did the weight of the machine weaken the sidewall? Was the spoil too close to the end of the treach? Did the stratum of wet sandy loam have any bearing in the case?

Examination of the trench showed that the sidewall of the caved-in section had been severely undercut. When the back hoe canted, due to the sloping topography in this vicinity and the section broke away, the cave-in occurred.

Who, in your opinion, was responsible for the accident? What preventive measures should be taken to prevent its recurrence? Yes, of course, rigid rulings were immediately re-issued regarding trench shoring, but unless management is alert to the shortcomings of humans and occasionally spot-checks these jobs, supervisors are apt to use their own judgment in the matter of shoring, which they all too frequently do, and this type of accident can occur, with disastrous results.

*Case No. 2.* A caulker was leading a wet joint. (A ladle of hot lead can produce an explosion when a little water is added to it. When a caulker is leading in a joint, and these big water mains must be leaded so as not to get a rupture at the joint, it must be done very expertly. But frequently when you dig down a way in these trenches, you strike water, and there is likely to be a little water in the pipe. You can easily understand that when you pour hot lead into a joint where there is water, there is likely to be a rather violent explosion.) A violent explosion occurred, and his face was spattered with hot lead. Fortunately, he was wearing goggles, but both lenses were covered with the material.

How do you lead a joint safely? Some insist that by setting the gate of the "snake" off center and pouring the lead in on the down side, a hissing of steam will follow, with no explosion. Others favor pouring a small quantity of kerosene oil into the joint, and claim the oil will do the trick. Still others have their favorite methods, but still the joints blow.

I maintain that basically there is one right way to pour a lead joint, and the right way is the safe way. Why isn't this experience pooled on a national basis, and standard safe practices in handling hot lead and other like substances developed and made available in the interests of operating efficiency and safety?

I should like to add this, that clear plastic face shields have replaced goggles for wear on all of our operations, and this reduces steaming and fogging to a minimum and provides more protection.

However, no one yet in the industry has been able to advance a practice for the joining of pipes by lead that can be guaranteed as safe.

*Case No. 3.* A plant employee strained his back while lifting a hundred-pound bag of lime. He lost time from work during the healing process. An investigation disclosed that this employee who was lifting a hundred-pound sack of lime, weighed 124 pounds. He was actually lifting his own weight. Ridiculous, wasn't it? We learned some of those things this week of the proper placement of employees—putting the round peg in the round hole instead of the square hole.

*Case No. 4.* A filter operator lost his balance and fell into an outdoor basin at the intake of a 200-foot covered flume, and probably would have been carried to his death had he not made a lucky grab and held to the sidewall. I said we don't have drownings, but we do have some close calls. You can't wrap safety belts around those boys all the time, but we can do one thing, as I shall show.



At this particular point of the intake the safety committee had not discovered that there was no strainer over this opening. Of course there is one now. There is always the danger of drowning to men who work around open inlets. Their danger increases during severe winter months, when it is necessary to break ice away from the weirs and the walkways out over the basins.

We should make sure that men who work around reservoirs and tanks can actually swim. For instance, the man who was drowned in this reservoir at Muncie, Indiana, couldn't swim a stroke. While he was taking a sample, he lost his balance, fell overboard, and nobody knew anything about it until several hours later.

We must provide a means of egress from these tanks. If there is no ladder or rope to help a man out who has fallen overboard, how is he going to get out, even if he can swim?

We have made mandatory the wearing of life belts and preservers, particularly where men are required to walk out on weirs in the wintertime to break the ice away.

As far as electricity is concerned, keep in mind that everything in a water plant is a dead ground. If you get hung up on 110 volts and you're standing on wet ground —and everything is generally wet around a water plant, in the pump room, particularly —you know what happens. You'll just be a gone duck.

No matter what the industry might be, there is a safety problem. Although the water works industry is apparently considered very safe, I want to say it is probably the most backward industry of all the utilities.

### Utility Fleet Operations

MR. A. J. NAQUIN: Last year the New Orleans Public Service fleet vehicles involved in gas operation had only 12 accidents. In seven of them we bumped into somebody. Two of the seven happened while backing up; the other five occurred while moving forward. Four other incidents involved somebody striking our vehicles while they were parked, and the last case involved a motorist running into the back end of one of our supervisors' cars while the car was stopped at a traffic light which was red. But in all those 12 cases we did not have one single minor injury case. You will note in the statistics that Mr. Stewart gave you that fleet operations do not constitute too big a problem. Even in the electrical industry, only eight cases out of 173 fatalities were due to traffic accidents, or only 4.6 per cent. However, we must not shut our eyes to the problem.

The transit industry has attempted to aid in fleet problems by the film "Wanton Murder," which many of you have used in your communities already.

We are trying to barricade properly, when we stop our trucks in the streets in order to perform a service. We have stopped completely the servicing of street lights on our main boulevards at night, where the truck that would have to change that light would have to stop in a high-speed lane. We stopped it five years ago, because there is only one man on the truck, and we don't know how to protect him safely from being knocked off his ladder by some motorist who doesn't see him.

In conclusion, I want to pose a general problem to this entire industry. It is a fleet safety problem. What can be done to identify our public utility vehicles so as to keep us from being struck in the rear? Can't we find a "best" design and a "best" color scheme, or black and white, or black and yellow, or aluminum and black? Should the stripes that we use be confined to the outside edges of the rear portion of the truck, or should they be completely over the entire back surface of the truck? Should they run vertically, horizontally or diagonally, as most of them do now? How wide should the stripes be? Three inches wide, or four inches wide, or what? Should we use the new materials like "Scotch light" for certain portions of those stripes, so they will be more visible at night?

If we do all of those things and carry them over to our barricading procedures, perhaps we'll improve our fleet safety.

CHAIRMAN BEAUMONT: Mr. Stewart, do you have any comment on the questions you had?

MR. STEWART: Here's a question: "If you have a compulsory rubber sleeve rule, are you experiencing difficulties in its enforcement? If no difficulties, then to what do you attribute your success?"

MR. KELSH: In about ten years we had to fire a lot of men in order to enforce the sleeve rule. We'd rather fire them than kill them. We had to push the thing all the time.

MR. A. E. ALLEN [Public Service of *New Jersey*]: In order to improve the attitude of the men with regard to the rubber sleeve rule, we took Mr. Stewart's report and combined it with a slide film made up in Boston under the supervision of the T.E.I. We had special meetings where we read the roll, part by part, and took some cases and discussed them very thoroughly. We then distributed a pamphlet, entitled "Let Us Resolve That We Have Had Our Last Electrical Contact."

Now I would say we have improved the attitude of our men toward the rules of rubber sleeves because of Mr. Stewart's report and because of the way it was handled.

MR. STEWART: A questioner is interested in climbing practices when poles are covered with sleet.

MR. C. A. DOW [Northern States Power Co., Minneapolis, Minn.]: One of our linemen developed a device which we are using very successfully in climbing high poles, slanted poles, or in situations where linemen have to climb many poles in rapid succession subjecting themselves to fatigue. It's a simple little rope contraption to hold the man secure so that if his spurs do cut out, he does not fall. It grips the pole and prevents his falling under any of the above conditions.

At our safety meetings we take along one of these devices and have the boys show the others how it works. I think it works very satisfactorily.

MR. ALLEN: We had quite a storm in the east, as you fellows know, that caused us a lot of difficulty with icing problems. We started out the first night of the storm to insist upon ladders to the first level—that is, the communications level—and from there on some of our boys used two belts. We found that this system worked well. The second belt was placed over the next obstruction before further climbing.

MR. DOW: One device is made of rope, but it has a heavy wire inside. It has a couple of handles on either side, so that it is an aid in climbing, also. Workers have the self-confidence that if something does happen, they are not going to fall.

MR. STEWART: Would you be willing to send a sketch or description of that to Mr. McDonald of the National Safety Council, who is our Section representative?

MR. DOW: Yes, we can do that.

MR. STEWART: Here's another question on rubber gloves. "What is the trend in ground-to-ground versus four or five foot poles?" What is meant by that, I take it, is "Do you require linemen to put their gloves on at the ground and keep them on until they return to the ground, or do you allow them to go up within four or five feet of the conductor, put the gloves on, and remove them four or five feet below the conductor when coming down?"

MR. HARRY MANN [Boston, Mass.]: I'm one of the representatives of a company that does have the ground-to-ground rule. In our system we have companies that have the ground-to-ground rule and ones that have the five-foot rule.

In our largest operating company in Narragansett we have had the ground-to-ground rule for 20 years, and they are well sold on it. We think it's the only safe way for men to work. I don't like this five-foot or four-foot rule that you have in some other companies. I wish there were some way we could abolish it in favor of the ground-to-ground rule.

MR. STEWART: Can we get a volunteer from the group that requires gloves to be put on only four or five feet away to tell us why they believe that is a sound rule?

MR. W. C. BOARDMAN [Kansas Electric Power Co.]: One of our companies has the ground-to-ground rule and one has the five-foot rule. The five-foot group has fewer cuts in gloves. If the gloves are torn in going up the pole, they're in bad shape at the top. We like the five-foot rule better.

MR. STEWART: You cause mechanical damage to the gloves when you put them on at the ground, and for the reason of protection against mechanical damage you prefer the five-foot rule which gives a better glove for protection against electrical hazards.

MR. E. M. CHASE [Central Vermont Public Service Corp.]: We have had this rubber glove rule, from the base of the pole up and down, for 20 years, and we have had one hand contact in that time, and that was because a tie wire got in under the

glove. That's why we believe it's a good rule.

We have a cuff that goes up to an inch of the top of the cuff of the rubber glove. We do not get enough leakage to make a difference there, and we think it's worth the extra cost to do away with burns. Our men believe in it entirely, and you can't get them to work any other way now.

MR. MANN: In my estimation, the principal argument for the ground-to-ground rule is that it can be enforced. The five-foot or four-foot rule is difficult to enforce.

We have the five-foot rule in a good many of our smaller companies, and we have had a good many cases of men working up in the primary area without their gloves on; they always come back with the point that "I didn't know I was that close. I was going to put them on but I didn't know I was there."

There is always a borderline in the five-foot or four-foot rule. For that reason, we prefer the ground-to-ground rule where there is never any question about where to put on the gloves.

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*Deceased.

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Many users of this volume will also find much value in its companion volumes. Here is the list:


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**Current Safety Topics in the**

# PULP AND PAPER INDUSTRY

**As presented in the Sessions of the Pulp and Paper Section at the 1948 National Safety Congress**


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**Volume 24**
**Transactions**
**1948 National Safety Congress**

**NATIONAL SAFETY COUNCIL**
**20 North Wacker Drive • Chicago 6, Illinois**

# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE PULP AND PAPER SECTION

This volume is a record of the session held at the 1948 National Safety Congress by the Pulp and Paper Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Pulp and Paper Section carries on in behalf of its members, and for the benefit of accident prevention work in the pulp and paper industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of pulp and paper plants. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on pages 50 and 51 of this volume.

# Safety in the Ontario-Minnesota Logging Division

By JAMES A. RYAN

Woods Manager, The Ontario-Minnesota Pulp and Paper Co. Ltd., Kenora, Ont.

In past years, when the time came in the early fall to get the camps ready for winter operation, there was a last minute rush to be sure all camps were in before the freeze up came. In those days tug boats towed barges of supplies and wanigans filled with men. Trucks, too, were loaded with supplies and men and headed for camp.

When the boats and trucks got to the camps they were headed for, there was general commotion in getting settled storing all supplies away for the coming months. There was plenty of foodstuffs; nothing fancy, but lots of good food. There was all the equipment necessary to work with and, yes, there was also a carton of medical supplies: indigestion pills, constipation pills, headache pills, bottles of painkiller, and bottles of cough syrup. There were bandages, ointment and a parcel marked "accident forms." All had been taken care of. With careful planning the supplies should see them through till break-up.

A few weeks later, back at headquarters your mail brings the first camp reports. There is an accident report in the mail and you see that one of the cutters has cut his leg while limbing a tree. You note that he has been sent to town for treatment. From a call to the doctor or hospital, you learn that the injury is serious and there will be a long layoff.

Production is holding up and all the pulpwood and logs are going to be hauled out on time. But how about all the men who have had injuries. Some had recovered. Others are still in the hospital. Little Joe may have trouble getting along with one hand now. He got a bad squeeze on a king pin hook up on the end of a haul trick. And as for Bill—well it was swift, and he never suffered long.

It was pretty grim. We managed to get our year's supply of wood to keep the plants running, but I think we also took our accident experience for granted. We probably reasoned that accidents just had to be taken in our stride.

We knew that the mills had a better accident experience, but their employees were more stable—they worked the year 'round, year after year. We knew too that our woods accident frequency was far too high—more than double that of the mills. Our compensation assessment rates were also double those of the mills.

One of the reports I read last August was prepared by the Department of Labor and Industries, Division of Safety, Olympia, Washington. Here are a few facts taken from that report:

1. Every four minutes of the day someone in industry dies as a result of injury. Think of it—360 employees a day. Since this meeting started, today at least two employees have died as a result of injuries.

2. Enough man days are lost to industry each year as a result of accidents—nearly forty-five million man days—to manufacture more than fifty million pairs of shoes.

3. And the amount of wages lost to employees each year as a result of industrial accidents would be sufficient to feed, clothe, and shelter a city nearly as large as Detroit.

What then can be done to improve our experience. We knew that in a year or two we would start cutting on limits to our north. This new operation would be different in many aspects from that in our lake area to the south. We would soon have year 'round roads into our camps to the north. Our operations were fast becoming more mechanized. The tote team was fast being replaced by the truck, tractors, dozers, sulkies. Many other types of power machinery would also come into use. Maybe the cutter with his saw would be replaced by mechanized equipment. Aeroplane and seaplane bases were being established in the area.

These trends all pointed one way. We were moving ahead along with the times. We were to have better communication facilities. We could drive to our camps soon, and if it was necessary, we could fly to camps in some areas. We had now experimented with a Sea-Bee plane for



thirteen months and had on three occasions used it to transport injured men from camp to the hospital at Fort Frances. The results were satisfactory, and, after some 400 flying hours this plane was to be replaced with a DeHavilland "Beaver" early this fall which would accommodate five or six passengers or two stretcher cases if necessary. With its 144 cubic foot cabin, considerable material could also be rushed to camps in emergencies.

We would also have two busses very soon—one for our Flanders area in the Fort Frances division and one for the Patricia area in the Kenora division. Each would seat twenty-three adults. In the Patricia area this bus would be very helpful also in transporting some 31 children to school in our headquarters camp. Why, then, couldn't we operate the year 'round? The yearly requirements of pulpwood and logs could be controlled better. Maybe with this improvement in communications we could work in some methods to improve our services to the camps. It seemed practical, and in this way we might eliminate some of the ghastly accidents we were having.

Our executive officers were eager to see a decline in our logging accident experience and were willing to go a long way in promoting a program. They had already seen the mill's accident rate drop considerably. Plans were made, and after considerable discussion and changes here and there, it was agreed that we would make a start on a concentrated safety program for our logging divisions.

Mr. R. W. Croucher, safety officer for all our operations was placed in charge and would be assisted by divisional safety supervisors—Mr. F. T. Morrish for the Fort Frances division and Mr. A. E. Minor for the Kenora division. Field safety assistants would tour the areas. They would inspect the camps for hazards, they would go out on the job with cutters, skidders, loaders, etc., to watch and instruct workers on safer methods. First aid classes would be organized and better and closer follow-ups could be maintained with medical and sanitation inspectors. This work is all being done now, and although the results are not yet what is desired there is a definite swing downward in our accident experience.

Going further with our program and to keep it in line with other improvements introduced into the camps such as diesel electric power units which now afford better lighting and better refrigeration, we also placed an emergency first aid outpost in the headquarters camp of one area. A qualified registered nurse is in charge. She has her own quarters at this outpost and bed space is available for three patients. When conditions warrant there is a plan to increase the bed space.

Contract physicians visit the camps at regular intervals and the nurse has contact with the doctors in town by means of radio. This service is used extensively on regular scheduled hours of broadcast and has been the means of reducing the number of cases that would have been routed to town for the doctor's attention. We presently operate 250 watt stations at our Fort Frances and Kenora offices and have nineteen 60 watt portable sets located at various operations, including two sets on marine units.

On one occasion, in our Patricia area, we had a loader fall from the top of a truck and injure his spine. He was taken into camp. The clerk of the camp phoned headquarters camp and kept his line open while the clerk at headquarters radioed Kenora. The Kenora operator phoned a doctor and kept her line open. By this hook-up it was possible to relay the doctor's instructions and also complete arrangements for transportation to the hospital.

Believing that the medical staff could assist us greatly in determining what should be placed in the camps for treating injuries and minor illnesses, we now route all requisitions for medical supplies to doctors. They check them over and make changes where they see fit. This service guarantees us that we have a proper and sufficient quantity of supplies in camp to take care of our needs and thus eliminates the infiltration of many patent drugs and medicines into our camp medicine cabinets.

Small compact emergency first aid kits are now being placed on all automotive and marine units. Travelling personnel working between camps and out of the head office are being supplied with pocket-size kits of such design that refills can be

obtained from supplies on hand at any camp.

Improved types of fire fighting equipment are located at each camp. Fire stations are also maintained at each camp with power pumps, hose reels, axes, shovels, etc. Each camp building has extinguishers located at convenient spots, as well as fire barrels and sand boxes where practical.

The old piece of sleigh shoe steel which cookees so liked to play tunes on to wake you up in the morning and to sound the time for breakfast, etc., is also gone. In its place a siren now sounds the warning, and other signals are also given on it. Camp personnel are instructed in fire fighting, and each camp has its own brigade. Ladders are spotted between buildings, and roof ladders are maintained on all buildings. In power plant houses and oil houses, smoking is prohibited. To cooperate with the forestry department, "tailor made cigarettes" are not allowed in the camps during the season of high fire hazard, and fluid lighters replace matches.

As the safety assistant moves around in the area from camp to camp, he submits written reports of his findings to the camp foreman. These are discussed and recommended improvements made on the spot as far as possible. Copies of all reports are mailed to the supervisors when recommendations made by field men are not handled on the spot; decisions are made and new policy is set, if necessary, by the head office.

What results may we anticipate from this program? Will it cut down on the number of injuries? Will it help create still better employee relations? We hope so, and see no reason why it should not.

If we can instill into the men the thought that we want them to work in a safe manner, our battle is won.

I am not saying we will be accident free in our future operations, but I firmly believe our frequency will drop to a much lower figure than 37.3 which is our average for the past eight years as compared with an overall average of 86.6 for the industry in our province over the same period.

We all know that the axe, so commonly used and often so unsafely used, is still the most dangerous tool we have in our woods operations. Page after page of instructions have been painstakingly written on its proper use, but if we do not follow through and pass this information on to the man using that axe he is still going to continue to hurt himself with it. Who then should be the one to do this work?

Our top executives cannot, but they want to see everything possible done to eliminate accidents.

Should it then be the woods manager, or his field men—the divisional logging superintendents? No. The camp foreman and his assistants, including the strip boss and the field safety man? Yes. These men have everyday contact with the worker, and are in a position to give instruction. Men who assign the day's work should see that the work is done safely.

It is not enough that the new man be briefed before starting out on his new job. You must follow up, watch him closely, show him how to do it the safe way, persevere with him. Once he knows that you are in earnest and are thinking of his welfare, you have won him over, and he will then take a better attitude. He is not going to swing his axe as carelessly as he did before. He will clean up around his working area and see that a tree is not going to hang up on an overhead branch or snag in the underbrush. He will do his limbing the correct way—standing on the opposite side of the tree that he is working on. He will also soon start observing the working methods of other fellow employees and will watch more experienced men to pick up a safety tip that he can use himself, and he will pass on to the newcomer valued information that he has learned.

This is the type of employee we are striving for and we hope we will be able, soon to have many more like him, but it is going to take time. We must be patient and never give up for a moment. Once you slack off, the workers' interest will drop, and once interest is gone it will be very difficult to get it back.

Is there anything we can do to assist the employee further in his off hours, or during his evenings in camp? We have already attempted to make his lot more pleasant by providing a fully equipped recreation room where he can read the daily paper or a good book or enter into supervised games and contests or see a movie. Why not make use of these facilities? If you have competent instructors you can schedule your weekly recreation programs so that first aid is taught.

You can include safety shorts when movie night comes to camp. You can arrange for short talks on current camp problems and discuss the safety angles of the jobs these men are doing. Let them enter into the discussions.

When the end of the month comes and it is safety draw night, make the most of it. Do not just present the award and wish him luck. Get in your safety plugs here. Tell them their efforts are appreciated, and it was only through their daily and constant watchfulness that this draw was now being held. Ask them for their continued cooperation, and tell about the experience of the camp further along the highway, where by simple arrangement they eliminated a hazard that had been causing some concern.



## Hazards Encountered in the Chemical Pulp Industry

By R. CHAPMAN

Chairman, Mill Accident Prevention Committee, Howard Smith Paper Mills Ltd., Cornwall, Ont., Canada

### Sulphite Process

*Handling Limestone* from cars or trucks to dumps involves some manual handling unless the limestone can be dumped from gondola cars onto dump trucks. If necessary to throw it over the sides of the freight car, workers should have foot and shin guards as well as heavy gloves, especially if the stones weigh up to 100 lbs. Correct lifting methods and footing are very important but often hard to achieve when standing on the rough stone. Hence the hazard of back strains and hernia is ever present. These conditions are aggravated under winter conditions and call for close supervision and for workers of rugged physique.

*Getting the Limestone to the Top of the Absorption Towers*—Whether a skip hoist or a narrow gauge rail car is used, the carrying device is usually filled manually and the above precautions have to be taken. When the latter conveyance is elevated to the top of the towers on a standard freight elevator, the rail car must be chocked to prevent movement and keep stone from being spilled down the shaft.

Dumping stone into the towers does not present any great hazard; but when removing tower covers the operators must make sure that the gas is syphoned or exhausted away from the opening before the lid is raised. Two operators equipped with gas masks should be on hand when covers are removed or replaced. In fact, any person required to work in this area should have a mask. Furthermore, one should be carried on the acid tower elevator at all times as a precaution in the event the elevator becomes stalled between floors; a ladder inside the elevator shaft should be provided for the same contingency. Some mills require workers to wear a safety belt when removing covers to prevent their falling into the tower when the cover is off.

*Breaking Down Stone and Cleaning and Repair Work Inside Stone Towers*—All acid and gas lines should be blanked off and the tower washed out and well ventilated before workers are allowed to enter it. Taking out and relining towers is a special type of work which will not be discussed here.

*Sulphur Burning*—Preparation of sulphur for burning, whether in powder form or in molten state, calls for precautions to prevent dust explosions or fires. Tanks holding molten sulphur must be kept from overflowing as they are usually above the operating floor.

When unplugging with compressed air pipes conveying molten sulphur or working on sulphur lines, valves or tank outlets workers should wear the following protective clothing: brimmed hat, rubber coat, pants and boots (with pants over the boot tops), gloves, and eye and face protector.



*Sulphur Storage and Handling* has been very well covered in Industrial Data Sheet D-P.P-5, and will not be discussed here.

*Cleaning Acid Making Equipment*—Burners, coolers and fan are cleaned during a shutdown period and the work does not present any special hazards unless burners are still hot.

*Acid Storage Tanks*—Wooden tanks need careful inspection and maintenance to prevent hoops from being corroded to the point where the tank could collapse. A breather pipe should be provided, and as it can freeze up on shutdowns should be kept clear to prevent the cover from lifting. The release of a large volume of gas might have serious results.

*Tank Cleaning and Repair*—Workers should not be allowed to enter tanks until after the tanks have been thoroughly washed and ventilated. All connecting pipe lines should be blanked off. Men entering tanks should be equipped with gas masks and wear a safety belt. Fellow employees should stand watch at the manhole until conditions inside have been established to be safe.

*Digester Operations*—Careful thought and handling is required of cooks and their helpers especially when operating steam, hot acid and gas valves to make sure they are right. When the digester is being filled with chips, it is often necessary for men to go into the bins to break down an arch. If steam is used for this same purpose, make sure it is shut off before men enter the bin, and see that the men are equipped with a safety belt and line. One man should not be allowed to work alone; there should be a second man above the bin to give help and spread an alarm in case of need.

Inspection of digesters for faulty linings or plugged and damaged fittings is often done between cooks by "coming up on the chips" and requires all valves or lines connected to the digester to be locked and tagged or blanked off. All persons in the digester house should be informed of the inspection. Men entering the vessel should be equipped with a gas mask and wear a safety belt and line. A watch should be posted at the digester opening.

*Blow Valves* should be kept locked while cooking chips and the key retained by the cook until needed by the helper at blowing time. It is the helper's responsibility to make sure that the hand plate is bolted down and that there is no water or acid in the blow pipe. Also he must notify the blow-pit man and see that pit doors have been closed.

*Blow-Pits*—All blow-pit doors must be battened down before a blow, after checking to see that no repair men are in the pit. All persons working near the pit should be warned to keep clear and avoid the fumes. Pit openings should be guarded so that persons cannot fall into them. Equipment such as ladders used for descending into pits need to be carefully inspected due to the corrosive action of acid, especially hemp rope ladders. When high pressure water hose is used to wash stock out of pits it is advisable to harness the hose to prevent injury to the user when working through pit openings. Open drains in the blow-pit room should be covered to keep men from stepping into hot blow liquor. Wooden platforms and steps are usually wet and very slippery unless covered with old felt or other slip resistant material.

*Knotters, Screening, Riffers and Filters*—Slippery flooring, stairs, flow-box covers and planking are a source of falls, especially when pulling hose for washing purposes. Only rubber boots with unworn treads should be worn. When washing-up flow-boxes, screens, etc., there is hazard in raising the heavy wooden covers wooden covers which are usually slippery. Where practical covers should be provided with handles or ring bolts. When flat screens are raised for wash-up and repair they must be handled carefully. In addition to using tackle for raising screens they should be blocked up before working under or around them.

*Bleaching*—Using hypochlorite and chlorine gas in one or more stages demands good ventilation to exhaust fumes from the working area. All operators should have their own gas masks located where they are handy for quick use. Control valves for chlorine should be readily accessible and all lines identified by distinctive colors. Exits should be provided for quick retreat in the event of a gas leak. An alarm system should be installed for warning all operators in the area involved. All operators in this department need to be well trained in the safe handling of chlorine gas and aware of its dangers. This subject is covered by Safe Practices Pamphlet No. 71.



Where caustic or milk of lime are used for pH control the necessary precautions are called for in handling same, these are also covered by Safe Practices Pamphlet No. 25.

### Lapping Wet Pulp and Drying Pulp

*Lapping Pulp* from wet presses calls for uniform size of laps and proper building of loads to prevent strain from overweight, and toppling of loads when they are being moved for piling or loading into cars. Due to heavy loads and wet conditions floors in wet-press rooms should get close inspection and be kept in repair.

*Drying Pulp*—Here there is a hazard of fingers being caught in the nip point. Also arms or hands may be burned on the dryers when passing the sheet. This is a recognized hazard and calls for proper training. There should be special alertness when breaking in new operators or spares for holiday relief. Catwalks, steps, and hand holds should be located for convenient and practical operation and constructed to prevent slipping. All broke should be picked up around the wet end to prevent slipping or tripping.

*Baling Presses, Handling, Piling and Shipping Baled Pulp*—When bales are wired outside of the press, operators should wear goggles to prevent injury from wire ends. Bales should be carefully made uniform in size and closely wrapped so as to make piling easier and safer. Piles should lean away from aisles. Mechanical methods for handling, piling or loading baled pulp are usually more economical and safer than manual methods.

When piling bales in car doorways tiers facing the entrance should be chocked to prevent them from falling forward if the car is rocked by the loading truck. As tiers may topple over if cars are shunted during the loading process, loaders should be warned to keep out of cars. Braces are sometimes used to keep piles erect. Car plates and gangways should be of sufficient width and securely anchored.

### Soda Pulp Process

*Alkali Recovery*—In soda and sulphate mills the make-up and recovery of chemicals used for cooking present much greater hazards than in sulphite mills. Caustic soda has to be treated with respect, being a very strong and active alkali. Whether received in tank cars or in drums as a solid this chemical requires careful handling. Handling caustics and unloading them from rail cars are covered by Safe Practices Pamphlets 25 and Chemical Industry Pamphlets 3 and 4.

If liquid caustic is received at 48° it is usually added to the causticizing process and becomes diluted and, therefore, is handled at low strength. However, whether the solution is green liquor, white liquor, or black liquor, it is still caustic soda from the standpoint of chemical hazard. The fact that the liquid is being used at high temperatures adds to the need for greater care when working with it. Operators must protect their eyes above everything else. They must wear rubber clothing on clean-up and repair work and also when in an area where there is leakage from tanks, pipe lines, pumps and other equipment. Where soda ash is used as the make-up alkali there is not the same hazard in handling but the eyes and lungs need protection.

*Lime Handling*—Many mills are using burnt lime for causticizing. This material has to be unloaded from box cars or trucks into the mill, a disagreeable job but not a hazardous one, even in the summer months if the necessary precautions are taken. The right type of men should be picked for this work as some have tender skin, or a sinus or respiratory ailment. Dust masks can be made from layers of cotton batting between gauze. They are very light to wear and the pad can be renewed often. If forearms rub against thighs when shovelling and cause irritation or if burning of the skin starts due to perspiration, a coating of petroleum jelly on the skin is a very effective preventive. Generally speaking, persons with fair complexions are sensitive to lime dust and should not handle it.

*Lime Burning and Slaking*—Injuries connected with these operations are mostly burns caused by hot lumps, or powder from kiln, or splashing from hot milk of lime. There are points in any liquor recovery system where operators have to



guard against hot material or equipment. In such places the eyes should always be protected. Deluge showers at convenient spots in the liquor recovery buildings are recommended. Workers should wear wide brimmed hats and rubber clothing should always be available.

*Liquor Burning*—Whether in rotaries or furnaces this operation calls for care on the part of operators to avoid coming in contact with hot equipment. Eye protection is very necessary when working around smelt or black ash.

Furnace and rotary rooms are dusty and alkali accumulates on pipes and beams; when disturbed it is not good for the eyes or the back of the neck.

Cleaning smelt and black-ash tanks has its hazards and calls for close supervision, especially when men from a general labor pool are used who are not familiar with the danger of caustic burns. This would apply also to any tanks or equipment being cleaned around the liquor recovery system, such as boiler breachings, scrubbers, de-gassing tanks and precipitators.

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# Wood Room Hazards

By GEORGE S. NELSON
Claims & Safety Manager, Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis.

The wood room of the average paper mill has been sadly neglected as far as safety is concerned. Many wood rooms are still being operated with over-age equipment. This somewhat antiquated equipment was built before safety had attained the prominence that it has attained in other paper making machinery. As a result, this equipment is either poorly guarded or difficult to operate safely unless the operator himself has been impressed with the hazards of his work.

The operation of conveyors, slasher saws, barking drums, chippers, etc., naturally create a great deal of noise. The noise itself is conducive to accidents because of the nervous strain that it puts on the employees whether they are conscious of it or not. For our discussion let us consider these pieces of equipment somewhat in the order of their use in wood room operations and start with the entry of the wood to the slasher saws and floating the wood from the pond to the conveyors.

The men who work on the ponds floating the wood to the slashers should have sufficient work space to avoid injuring fellow workmen. They need room to handle their pike poles and pickaroons. In the wintertime they should wear suitable clothing to protect them from the weather, and also footwear which will give them a secure footing.

Shelters or wind breaks should be erected during severely cold periods to protect them from frost bite and wind burns. In the summertime some protection from sun stroke and heat exhaustion should be supplied.

Slasher saw operators should be protected by a heavy fine mesh wire screen between them and the saws to stop flying chips, nails, bolts, or even pieces of the saw which may break when it encounters foreign objects.

Conveyors carrying wood into the wood room should be constructed with adequate side boards.

Employees should be prohibited from riding conveyors to get into the mill. An employee was injured quite seriously several years ago when he ignored instructions forbidding riding on conveyors. As he reached the end of the conveyor, he lost his balance and was unable to step off before the conveyor reached the end of its run. As a result his foot was forced underneath the deflector bar and caught between the bar and the moving conveyor plates.



*Result:* a broken ankle causing several weeks lost time and a slight permanent disability.

Employees who work on sorting conveyors in the mill should be instructed in the correct use of the hand tools and in handling wood so as to avoid injury to themselves or other workers. We find that it is difficult to keep these men spaced far enough apart. They have a natural tendency to work together so they can talk with each other. When two men attempt to throw blocks of wood at the same time the result is injured hands.

We find that many men handle pickaroons improperly. We discontinued the ring handle type pickaroon a good many years ago because workmen are unable to control it well. If one's grip on the handle loosened, the point would swing around and cause a severe puncture wound in the forearm. Even with the straight handle type of pickaroon we find that many men swing it in such a manner that a continuation of the arc is in a direct line with their feet. If the operator should miss the block or if the pickaroon should glance off from a knot it would often injure a foot or leg. These men should be taught to follow through with their hand in such a manner that if they should miss the block or the pickaroon should glance, it will continue on harmlessly.

Barking drums should be completely guarded at the feeding end. Chain drives, etc. should be enclosed. Men should not be required to work in positions where it is possible for them to slip and be thrown into the barking drums. This may seem elementary but not too many years ago an incident like this occurred in one of the paper mills and resulted in a man's death. No one will ever know exactly what happened because no one saw him enter the drums; but it is presumed that he slipped and somehow fell into the revolving drum. His absence was unnoticed until shreds of clothing began coming through at the discharge end of the drum. This probably could not happen now but it is mentioned just in case some of you have barking drums which are not adequately protected.

The wood room probably requires more guards than any other department in the mill, and inspectors and foremen are required to see that guards are not removed, misplaced or damaged.

A review of the statistics on wood room operations shows that accident causes in the wood room are no different from those in any other department. Less than 20 per cent of the accidents are caused by the lack of a guard. The remaining 80 per cent are due to personal causes.

We have found that certain persons cannot work in the wood room because of allergies. If they are permitted to work around certain types of wood they develop dermatitis and lose many days from the job. Hemlock poison, poison ivy, poison oak and even damp conditions produce skin rashes. Poison ivy is not so common, but a person may contract this skin ailment by handling wood which has been harvested from a poison ivy area. As a precaution against contracting these skin disorders, protective creams or protective clothing should be used. It is difficult to get men to wear protective clothing in the hot summer months and in such a case protective cream may be more desirable.

It should be mandatory for workers in wood rooms to wear goggles and other protective equipment. Toe guards and shin guards should be required for working in wood bins or in handling blocks.

Even with all of these guards and protective devices, accidents will occur in the wood room just as they do in other departments unless supervisors are convinced of the importance of safe habits. New employees should be properly instructed by their foremen and should be checked regularly. Back strains and hernia caused by lifting are preventable only in this way.

It is difficult to impress upon foremen who have been in the wood room for a great many years the importance of teaching their men how to lift properly and how to do the many other jobs with safety to themselves. A great many wood room workers are middle-aged and you often get the argument, "We have done it this way for 10 or 20 years; I can't see why we should change now." It may be a rather drastic move to make, but it will often be wise to transfer a foreman or worker who makes such a statement to a job of less importance, if he cannot be convinced that



old methods are actually the cause of his bad frequency rate.

At one time we had considerable difficulty with large logs because of protruding knots and projecting butts of limbs. These projections made it difficult to handle logs on the conveyors and the men were subjected to undue strains. Often they were obliged to walk across the conveyor on the logs in order to straighten them out or twist them over with cant hooks to line them up with the saws. The only remedy for this problem was to get Timberlands employees to properly trim the logs before shipping them to the Mill. This was accomplished and we had no further difficulty from that source.

Another item that bothered us considerably for awhile was the throwing back of chips out of the chippers feeding spout. When the spout was empty chips were thrown back with great force endangering operators. The problem has been met by putting baffles in the spout. These baffles are so constructed that the wood will force them down while going through the spout but when the wood has passed the baffles will resume a position to stop the chips from flying through the mouth of the spout.

We also found that in changing from soft woods to hard woods wood room employees were often injured by pickaroons because they had not anticipated the change and did not exert enough extra force in swinging the pickaroon to imbed it in the hard woods.

The overhangs in the wood bins also require constant attention. Employees fail to observe that they are producing an overhang and exposing themselves to falling material. We insist upon wood bin employees wearing shin guards and metal foot protectors. We believe that safety shoes give insufficient protection. A man working in the bin requires protection over the entire foot and the entire leg.

We have instituted a regular inspection of conveyors to check for sharp or protruding edges and conveyors are checked at least weekly in order to detect these hazards.

A few months ago one of our employees was injured when he was struck in the hip by the point of a pike pole. Upon investigation we found that this particular man wanted his pike pole for his personal use. At the end of every shift he hid it beneath the return plates of the conveyor, so that other workers would not use it. On the morning of the accident he reached in to get the pike pole out of its hiding place by pulling the point of the pole towards him. As he did so the pole handle became entangled in the return plates of the conveyor and thrust it toward him so fast that he could not get out of the way. The pike hit him in the hip and caused a serious puncture wound. Had it hit him in the pit of the stomach the injury would have been much more serious. We issued instruction, that all poles were to be put on the rack at the end of the shift.

A great many hand injuries are caused by inattention on the part of sorters while working over the conveyors. They often do not remove blocks promptly or, through inattention hold the block on the side of the conveyor long enough to allow the oncoming wood to pinch their hands between the two blocks.

Wet, slippery bark is an ever present hazard in the wood room and can only be controlled by continual cleaning. Wet bark should never be allowed to accumulate on platforms or work areas. In our plant the cleaners are responsible to one central cleaning foreman and are assigned to certain jobs within each department. In this manner we are assured that a department foreman will not assign one of his cleaning men to a production job at a rush time. When we assign a man to cleaning up the bark we know that it will be done.

There is also considerable hazard in handling saws which are being taken back to the slashers after filing. These saws must be carried only in a frame which will allow handling without danger of being cut by the sharp teeth.

While a great many advances have been made in wood room operation, there is still a lot of room for improvement. Better design will affect only a small percentage of the accidents which occur in the wood room, but it will eliminate the most serious ones. The greatest proportion of the accidents occur from mishandling tools and equipment which are a responsibility of the individual plants and, therefore, a challenge to the safety directors to carry on a stronger educational program.



# The Accident Prone Can Be Helped A Simple Approach

By C. L. R. DOUGHERTY

Assistant Manager, Industrial Relations, Union Bag & Paper Corp., Savannah, Ga.

In the early part of this year one of our superintendents was reviewing his department's recent safety record. His close analysis of the accidents showed that it would have been a dandy, if it weren't for the accidents of one man. The records showed that this man got hurt often and the superintendent felt that possibly the proper thing to do was to transfer him to low risk work —just as soon as he got out of the hospital and recovered from the broken leg he suffered on the job the month before.

To be sure of fairness in judging this man, his entire past record was searched and it showed that he got hurt each eight months. He had been injured 17 times during his 12 years at our company. The other workers in his crew doing exactly the same tasks as he had under the same conditions, day in and day out, had put in 25 years with only three injuries. Argument with such simple figures seemed impossible. Joe was accident prone.

To some supervisors, "accident proneness" connotes a no-good bum who just gets hurt and who probably should have been fired years before. It seems likely that everyone will agree that a man who gets hurt more often than his fellows in the same circumstances is accident prone. Joe did this, but he wasn't a no-good bum. He was considerably above the average in efficiency on his job. He was a pleasant fellow with his associates and his supervisors. He paid his bills, went to church, and fulfilled the duties of a good citizen.

His superintendent felt in spite of his serious failure in safety that he was a profitable worker to the company. Having this in mind, the safety department started casting about for a way to make Joe an all-round efficient worker by improving his safety record. The National Safety Council came through with the published material on accident proneness and stimulated us to approach the problem.

First off, we decided to look at the ten most accident or injury prone workers in our plant. Now, one definition of an accident is an inevitable occurrence due to the action of unchangeable natural laws. Needing an arbitrary standard as to what an accident was, we modified this definition for our purpose to have it mean an injury, occurring on the job, serious enough to warrant sending the injured to a doctor. Our plant does not have a full time physician, so this made a good division point. Later developments made it seem most desirable to us that we had used this measure rather than the usual lost time standard because it is one step nearer the careless act and the cause of the careless act, and *because we found our ten accident prone people were definitely not malingerers and actually hated to lose time.* In fact, in several instances it appeared that they had been most insistent on returning to work before the doctor felt that they were fully recovered from injury.

We studied the individual safety records of our 4,600 people and segregated those who had suffered as many as three injuries requiring a doctor's attention in the period 1945-47 inclusive. The record of each such employee was then searched back to the time of employment and the number of accidents, as defined before, per year was found. The ten workers with the most accidents per year were thus discovered.

The average worker in our plant in 1947 had one doctor case for each six years of employment. However, the ten selected averaged one each six months. These ranged from an accident each four months for the man most often injured to each eight months for the man least often injured. As you might well expect, six of the ten were maintenance men who, we believe, are exposed to more hazards than the average worker in the plant.

A wealth of material for making proneness studies such as the Council has in its library became available in the ten records. However, we were most anxious to improve the ten and felt that, pending scientific



studies, we would be remiss if we did not take immediate action to prevent further injury and possibly even death in this extremely vulnerable group. One intriguing case sustained these injuries: foreign body, left eye; contusion, left foot; fracture, left heel; laceration, left index finger; laceration, left knee; strained muscle, left lumbar region. This man was not left-handed, nor did he lack strength on the left side. He was a young fellow and could recall only one serious injury before coming to work for us; he fell off the barn when he was nine years old and broke his arm—the left one, of course.

Subscribing to the theory of a great American scientist that to have a theory, even a false one, is better than to attribute events to pure chance, since chance explanations leave us in the dark and theories lead to confirmation or rejection, we decided to intensify the use of techniques that had been proved of value in improving the safety of the average worker as a theory towards helping these people. The first was:

**1. Talk with the Division Manager**

Our plant is composed of several divisions: the paper mill, including wood yard, pulp mill, power plant, etc.; the bag factory; the box factory; and the usual service divisions. Of our ten men, eight were in the Paper Mill Division and two in the Bag Factory Division. Our box factory had not been in operation long enough to have any employees in the group. Each of the men had a talk with the manager of his division in the presence of the man's immediate supervisor. Our management group had serious reservations about this step, because it pointed out so clearly to the man that he got hurt too often and failed in an important part of his work. It was decided, however, to state the facts plainly lest our failure to do so would contribute in the future to more accidents by failing to bring the past ones properly to the worker's attention.

The managers emphasized and re-emphasized that their talk was not a warning of discharge or discipline, but was recognition of an unsafe condition and notice of management's effort towards correcting it. Our fears about this technique were soon allayed. Several of the men were shocked to learn that they were injured more often than their fellows. The records were shown to them. Others felt that their injuries were due to circumstances beyond their control. The managers explained to these that this was understood and that it was recognized that a man would not purposely injure himself. The managers outlined in these individual meetings the things that would be done to assist the men to avoid injury, and solicited their cooperation.

Too much emphasis cannot be placed on the splendid job that the managers did in reassuring the men that they were not about to lose their jobs, but were to be given real and practical help. Even the grapevine had it that the men felt that the company was doing a fine thing in trying to help them.

We believe that had we failed to dispel their fear of losing their jobs, we might well have increased the number of injuries. All of us like to feel that our boss is interested in our welfare and probably the bigger the boss, the more flattered we are by his interest. Certainly the talk by the paper mill manager and the bag factory manager to each of their men had tremendous weight for good.

At this point it might be well to say that we have not attempted to evaluate the different techniques against one another, since we felt that they were each an important part of the approach. In my mind, however, this talk with the division manager certainly ranks near, and probably, at the top in value.

**2. Thorough Physical Examination**

All of us have heard, and probably even speculated ourselves, that an accident might have been caused by poor physical condition. Too, all of us know the sense of well-being that we have following a thorough physical examination when the doctor has said that we are in tip-top shape. Besides these psychological values, there was the good possibility that we might find conditions that needed treatment. The value of this technique was readily grasped by the participants.

Each of the ten was given a thorough examination by our company doctor. It was the plan, if indicated in the individual case, to do X-rays, blood chemistry, etc. However, the findings were essentially negative, so no extensive diagnostic procedure was deemed necessary. In fact, the doctor said that two of the men were as fine physical specimens as he had ever seen and the others were in good health and condition, having only the usual disabilities to be expected in the general population at their age. The doctor allowed ample time for each man to give his history and talk over his problems. No conditions were found which required surgical or medical correction, nor were any found which apparently contributed to the high injury rate. The doctor did notice that all of the men but one tended to have a higher nervous tension than his average patient.



**3. Examination by Opthalmologist**

Much thought has been given to the part that poor vision, poor depth perception or other failings in eyesight might have contributed to accidents. The men were sent individually to the eye specialist who took ample time with each patient. Particular emphasis was devoted to depth perception. However, the findings on depth perception were not significant. We think we hit pay dirt here, however, as five of the ten were given prescriptions for glasses and two were recommended for minor surgery.

It is our practice to specify certain occupations as being visually hazardous from either or both of two standpoints, that is, danger of foreign bodies and danger of failure of vision, causing the employee to hurt himself or another. Recognition of the first of these is, of course, quite usual in safety work; the second is best illustrated by the example of a third hand who has an error of vision and by this error puts his hand on, instead of near, a knife and therefore gets cut. People in these specified occupations are furnished their first pair of glasses fitted with prescription ground safety lenses without charge. Of course, the maintenance men in the group were already classified on our free list for safety glasses. We added the others as special cases and had the five who needed glasses fitted with them.

Coincident with our intensive work with the accident prone, we have had a serious interest in poor eyesight as a cause of injuries and another of our projects has been to screen all of our employees for visual deficiency and refer to the eye specialist those needing treatment. This, of course, is another matter. However, it might be of interest that our doctor has been most impressed with the commercially available device that is used to screen the workers and refer them to him for professional diagnosis and care.

**4. First Aid Course**

It is widely known in the safety profession that a person who has studied a First Aid course is less likely to get hurt than one who hasn't. I have seen First Aid courses used numerous times as a safety device and never fail to reduce the accident record. In talking over our general plans before we started work on the ten, we had considerable reservation as to the advisability of seeming to single the men out. So with this in mind, we had previously made arrangements for several other men to participate in the First Aid course. After the talk with the division managers, however, we felt that this precaution was not necessary. Nevertheless, we continued the others because plans had already been made.

We used the American Red Cross Standard First Aid course, taking 18 hours to finish. The classes, two hours each, were held during the work day on consecutive days until finished. Arrangements were made for the shift workers to remain on the day shift during the course.

Anyone who has been in a First Aid course knows that besides the subject matter, items ranging from horticulture to politics and Persian poetry are thoroughly discussed. This was a swell place to enter good notices for such items as safety shoes, salt tablets, and the many small, detailed, practical things that go to make up an industrial safety program. Our plant has a fully equipped First Aid hospital staffed with nurses 24 hours a day and it is against the rules for an employee to undertake First Aid, so our only aim was to make the students more safety conscious. We think that First Aid instruction reduces injuries by making the worker see an injury in terms of pain.

**5. Interview**

Times without number following a serious accident, all of us have heard that it was most probably caused by the injured having some problem on his mind. In some cases we have even known of financial worry or domestic trouble which we strongly felt may



have been responsible for an accident. It seemed logical to seek out problems that might be bothering the ten men who were injured so often.

The aim of the interview was not in the nature of counseling, but more of giving the man an opportunity to "get things off his chest." It was felt that in order to do this properly, the interviewer had to be actively and expressively sympathetic and not appear critical to the men, regardless of the ideas or actions talked about.

The interview was opened by asking what the man thought about the safety clinic. This was a safe opening because at this stage, following manager's talk, examinations, and First Aid course, each man had expressed and corroborated by his actions his idea that the clinic was a good thing and that the company was generous in going into it.

The individual's personnel record was then brought up to date. Now this was and, as you personnel men know, always will be desirable. We corrected five year old addresses, number of dependents, etc. However, it was also an excellent device to get the man to tell about his family and go on from there to his problems, financial or otherwise.

Nine of the ten responded to the interview in a wholehearted "bars let down" fashion. One, while entirely cooperative and courteous, kept his guard up securely. A solution for this case did not occur to us until too late; but, when we use the technique again, we will prepare for at least two interviewers, so that where one fails, the other can take over. Our interviewer .. that this fellow was too poised for him to handle.

Two minor financial problems were uncovered and the men were sent to the plant credit union, where help was given.

No problems were discovered that we could feel were responsible for the gross injuries to the group. Of course, the strong possibility of worry over an immediate temporary problem causing a specific injury was not explored in this clinic.

The interviewer noticed a higher nervous tension in each of the men than is noticed in the general population. This tension persisted even after rapport was established and was expressed by constantly changing positions, crossing legs, etc. One man unlaced his right shoe completely five times during the interview.

One other fact established in the interview was the man's opinion on why he was injured more often than his fellow workers.

### 6. Follow-Up

Each month since the clinic the safety man has visited each of the ten workers and his supervisor individually and privately. The follow-up has been simple with the men: "How's tricks?" and then a short conversation. With the supervisor, the fact that these men need more safety attention than the average has been emphasized.

The foregoing devices have been our simple approach. The value of most of these are apparent and have probably been useful to each of you with your own safety problems. We find, however, that there is one value that can be easily overlooked. For lack of a better term, I'll call this "Special Attention." It is simply the theory that if a person is sympathetically noticed over and above his fellows, he will attempt to win the approbation of the noticer.

*Maybe* you would like to know something about the ten:

They gave three reasons for getting hurt. Four felt they were injured by too close attention to the job they were doing. Two felt that they were hurt by the acts of other people without, however, blaming the other people. One felt "at he was hurt by a combination of these two. Three had no opinions.

The supervisors ranked these men as equal to their fellow workers as to production; five above average in the crew; four average; one slightly below average.

Psychological tests were available on nine of the men and showed that eight were above average in manual dexterity. This is confirmation of the theory which has been explored at several different places correlating high incidence of accidents with above average dexterity. These had urban and seven rural backgrounds. There were no nonwhites.

They did not vary significantly from our normal population except in getting hurt so often.

Now it would have pleased us to report a new and unusual device to solve all of our accident prone problems. We can say that the simple, practical tools which I have described and which you all have used will help the accident prone.

We would like to report a 100 per cent success. We can't. In the six months since the clinic was started, statistics indicated that there would be ten injuries to these men. There were two. We believe that this reduction in predicted injuries amounting to 80 per cent is beyond the realm of chance because, unfortunately for our record, the number of injuries increased in our general plant populations during this same period.

The items that we have developed in this clinic are available to you all, and we hope they will be of use to you, as many of you have helped us many times in the past.



More light might well be shed on the accident proneness of these ten men, if it were possible to probe deeper into their psychological make-up. Pioneering work, seeking the cause of injuries in psychic maladjustments, has been done and is going forward at a rapid pace today. It might well be that the coming years will see the psychological maladjustments of the accident prone discovered and treated by psychologists and psychiatrists in the same fashion as injuries that deform and hemorrhage.

While recognizing that our statistics would be much more conclusive if a longer time had elapsed, nevertheless we are convinced that the accident prone can be helped —and that the accident prone are truly worth helping.

## Pulpwood Logging

### (A Round Table Discussion)

*Conference Leader:* A. E. Minor, Safety Supervisor, Ontario-Minnesota Pulp & Paper Co., Ltd., Kenora, Ont., Canada.

*Conference Expert:* Arthur Nelson, Jr., Chief Forester, The Flintkote Co., Meridian, Miss.

CHAIRMAN MINOR: The first question has been submitted by A. C. Blackman, Department of Forestry, State of California. "What woods operation do you find to be the most hazardous, and how do you control injuries?"

MR. ARTHUR W. NELSON, JR.: I think the preparation of the wood—the cutting down of the trees and the bucking-up of the wood—contributes most of the accidents because of the fact that no two sets of circumstances are ever the same and no two trees are ever alike. It has been our experience that most accidents occur in the cutting of the wood itself rather than in its transportation. I think that is due principally to the fact that the axe is used more at that part of logging than at any other point.

MR. GEORGE S. NELSON [Claims and Safety Manager, Consolidated Water Power & Paper Company, Wisconsin Rapids, Wisconsin]: I agree. Out of eleven accident reports that came in from our camps this last week, six of them were from accidents in cutting down and bucking.

MR. A. C. BLACKMAN [Department of Forestry, State of California]: Do you use chain saws in any of your operations?

MR. G. S. NELSON: Yes, in some.

MR. A. W. NELSON: Are any of you operating slasher saws either in the woods or at landing where the entire tree-length is skidded in and bucked up mechanically? I wondered if that had any effect on the accident reduction as against bucking the wood at the stump. Some of the mills in the South are experimenting with skidding full-length trees to a central cut-up mill, using either a slasher or one that puts a stick through and cuts off one bolt at a time. The question came up whether this method would be effective in eliminating a lot of accidents that would be caused by cutting. I wondered if any of you had gone into that matter.

MR. R. O. HELBERG [Employers' Mutual of Wausau, Ironwood, Michigan]: I have seen several tree length logging operations. Of course, such operations cut down on the amount of hand labor, thereby tending to reduce the number of injuries due to hand tools. If it is guarded as it



should be, that equipment will do a good job in reducing accidents. I think the Marathon Corporation is using quite a bit of that equipment in Ontario. One of the jobs that I saw was an experimental attempt to use it in Michigan and the jobber in particular had a very fine accident experience on that job. So I would think that it would tend to eliminate hand tools such as the axe. Of course, you still have limbing and swamping which produce hand tool accidents.

CHAIRMAN MINOR: Would we be safe, then, in saying that the operation that has the most injuries would be the cutting down or the falling of trees and the bucking? Is that the consensus here in the varied operations?

MR. HELBERG: I would think so inasmuch as the bigger operators use mechanical means for loading and thereby remove considerable exposure.

MR. BLACKMAN: Our findings did not agree with this. That is the reason I asked this question in the first place. In California we are concerned with accident prevention in the woods as well as in the sawmills. The need for lumber has brought many new people into the lumber business who didn't know very much about it. We produced 2,500,000,000 board feet of lumber in 1947.

The logs that we haul out of the woods are from 20 to 25 feet long and from 16 inches up to 5 feet in diameter. Most of our fatalities occur in the woods. One out of every 500 men employed in the woods is killed each year. That is a high rate. We have done some analysis to learn the sources of trouble. The chain saw provided us with about 40 per cent of our disabling injuries of all kinds. Hand tools— axes and pickaroons—were second. That means, of course, we should concentrate on chain saws.

MR. A. W. NELSON: I worked in Idaho for four years and got a little experience in big timber. I think the difference between pulpwood (I know we have small sticks of wood, 12 to 18 inches at the largest) and the big timber out there is that any accidents that happen result in a much greater severity of injury. For instance, in the South I was on a contract job where the man running it got in a hurry on a Saturday morning. He sat down on a log to figure up his time and didn't watch where the cutters were working. They were working towards him. He didn't let them know he was there and they threw a tree on him. He got out of that with just a beating on the head because the branches and limbs were supple. Anybody who gets a tree dropped on him in the big timber is a goner.

I remember a very good friend of mine who worked with Weyerhauser. He was with four men in an automobile, testing some radio equipment, and a tree fell over on them. I guess it was a snag. It smashed the automobile and killed all four of them. Down South, where you have small timber, and in the Lake States too, if a normal-sized pulpwood tree hits a truck cab, the cab is strong enough to hold it. The cab will even shield the driver from falling wood. So I think the difference is in the severity.

If a limb falls off of one of your trees or the top falls out while they are felling it, a man gets killed just like that. In the smaller timber, you have the same causes for the accident, but the result is not as bad. I would like to see if any of you other men have the same idea about the difference between East and West Coast logging. I think the cause factors are about the same, but when you have an accident in the West it's a bad one.

MR. HELBERG: It has been my contention that logging operation accidents, regardless of the part of the country or the type of logging, have the same basic and fundamental causes, but the other morning at the logging session of the Wood Products Section, the majority of the men there were Southern men, and they disagreed with me entirely. In fact, if you give them a poster for Michigan or Wisconsin or Minnesota, it just doesn't apply down there. Their reason was that we put out a poster with shoes and woods clothes as we know them in the North Central States, but down South, their woodsman is a negro who has no shirt and doesn't even wear shoes. But I still say that the act that he is performing has the same hazard.

MR. A. W. NELSON: I think you are absolutely right. We have the same difficulty, you might say, in our forestry information. We have timber and logging information films that were made either in the Northern or the Lake States or out on the West Coast. You show them to a group of local Southerners and they have absolutely no conception of it. They are seeing trees and people, and you know a more intelligent person could derive the same pattern and apply it to his own business. But when you are dealing with people of a general low educational level, you have to tie it down to what they can see. The scenes in posters need to be familiar.



MR. HELBERG: There is no doubt that there is a psychological problem there. Take the film produced by the National Safety Council, "Timber." That was produced in Washington or Oregon. I was telling Mr. Griffin that we had a meeting and called in a lot of lumbermen and showed this film to get their reaction. The fellow who introduced the film said that it was taken on the West Coast. He wanted to find out whether it would apply to operations here. The unanimous decision was that it would not. Still I have used that film for the past two years very successfully. When I go in, I say, "There are some things in this picture on woods operation that will apply very much to your operation." They think it is a wonderful film. So psychology needs to be used in the introduction.

CHAIRMAN MINOR: Is it generally agreed then that the most hazardous operations are the felling and the bucking of the tree both in pulpwood logging and in sawmill logging as you have it on the West Coast.

MR. BLACKMAN: I think that our greatest number of injuries comes from the handling of the logs after they are bucked. They have got to be pulled by cats down a logging road and loaded on a truck and transported from there to the sawmill. They have to operate over logging roads, and we sometimes have cats turn over.

MR. A. W. NELSON: In the South most sticks are cut up to where an average man can usually pick them up. In some cases it takes two men. But they are bucked up into four or five foot lengths or five-foot-three-inch lengths, whereas some of your western logs may weigh 200 or 250 pounds, and some of your logs weigh 10 tons or more in one big stick.

MR. BLACKMAN: That is right.

CHAIRMAN MINOR: If that is the answer there, we will go to Mr. Blackman's next question. "How do you train fellers and buckers?"

MR. B. R. ROY [Woodlands Department, Spruce Falls Power & Paper Company, Limited, Kapuskasing, Ontario, Can.]: Actually our company hasn't any training program. Up until just recently we have had a lot of displaced personnel from Europe, and we have used old foremen as cutting instructors. That is not standard yet. We intend to go into it much deeper.

MR. GEORGE POTTS [Ontario Minnesota Pulp & Paper Company, Limited, Fort Francis, Ontario, Can.]: That is exactly what we do.

CHAIRMAN MINOR: Our assistant foremen train inexperienced men.

MR. A. W. NELSON: When men are working in pairs on a cross-buck, the foreman may pair off a new man in the camp with an experienced feller. The old man can train the new man. That is about the best way to handle the situation in camps where the foreman has got so much else to do that he can't take the time individually. That is not a very good system, but, nevertheless, it seems to be rather predominant.

MR. BLACKMAN: May I ask this question? Is this new man who has come in, one who has never worked in the woods before or has he just never worked for your company before? Do you send him to the camp and depend upon the assistant foreman to train him?

MR. POTTS: We do.

MR. BLACKMAN: What kind of training does the assistant foreman give him?

MR. HELBERG: In our area, a green man coming into camp alone would be given a job as a swamper or something like that. When new men come in as sawyers or buckers, they are usually experienced men. They come in with their partner in sawing or bucking or in drinking—whatever they happen to be doing—and they stay three or four months or years at a time. But men new to the work usually come in alone and start off on some of the other jobs in the woods where they can learn the operation and receive their training that way. As far as I know they never start out



as a bucker or a sawyer for their first experience in the woods.

MR. A. W. NELSON: In places in the South where there is no swamping, the first job for a new employee would be as a feller and a bucker combined. But here we are dealing with labor that has always cut wood at one time or another—even if just cutting firewood on the farm. Although they have some acquaintance with the tools, that doesn't mean you can assume that they are going to do it correctly. It is sometimes easier to have a man absolutely ignorant about using tools than to have him come in with a lot of preconceived notions that are all wrong.

CHAIRMAN MINOR: Has anyone a job instruction training program in effect? Do you have men who go around and instruct on these different jobs?

MR. W. R. CROUCHER [Minnesota & Ontario Paper Company, International Falls, Minn.]: You have, Mr. Minor.

CHAIRMAN MINOR: Yes, I have. I was waiting to see if any others have. We have such a program in our company. This man goes through the operations from camp to camp. He takes each occupation and studies it. Then he goes out and stays with the men on all the different jobs and learns all the angles. He conducts classes where the men give the answers. He conducts a round-table discussion such as we are having here, but he holds it down to a specific job and talks about it. He thinks up everything he can about how to do this one job. The men themselves bring in the information. The instructor keeps his program rolling and fires the questions to the fellows. From their answers he builds up his report.

MR. BLACKMAN: How long have you had that program?

CHAIRMAN MINOR: We just started it recently.

MR. BLACKMAN: Have you noticed any measurable improvement?

CHAIRMAN MINOR: I can't say that we have yet.

MR. BLACKMAN: We apparently have the same problem in California and do the same thing. And we have an additional complication. Much of the woods operation is carried on by contractors who get paid so much per 1,000 board feet. They are considered employees, however, and not independent contractors, for purposes of compensation insurance. We have gone from 250 sawmills to 1,300 in the space of five years.

MR. A. W. NELSON: Do you have chain saws on your operations?

MR. BLACKMAN: Yes, we have some power saws.

MR. POTTS: We have, but not many.

MR. A. W. NELSON: I wondered in your job instruction training whether you did any specific work on chain saws?

MR. POTTS: We have experimented with chain saws, but the piece-workers want the wood cut for so much a cord. Those fellows can't produce as much wood with three or four men as they can by cutting alone with ordinary hand tools, so, therefore—

MR. HELBERG: I think that you will find that the new one-man saw is going to be introduced into the pulpwood operation. It is used very much in our area now. A year ago, three out of four camps that I went into hadn't ever used a power saw. In the past year, I don't believe there was a camp that I called on that didn't have from one to four saws. A couple of partners buy a saw and use it on a job. Some companies furnish such saws. Mostly they are, as we call them, "gyppos" or contractors in a small group. Two, three, four or five men buy their own saw and come in with this new one-man saw. I think you are going to find a lot of pulpwood sawyers using them, as they are fast.

MR. POTTS: Are they lighter?

MR. HELBERG: Yes, they are. You can carry this saw around in one hand and there is nothing to it. I recently took some pictures of men using both the two-man saw and the one-man saw. Men who have started to use a power saw wouldn't go back to anything else. They were entirely sold on it. They were getting out pulpwood and sawing timber. They claim that it doubles their production.

The companies that produce chain saws are now having their distributors set up a service unit. If you buy a saw from them, you get service. If a tree comes down and breaks the chain, you don't have to wait three weeks for a new chain. You get service within a day. That has been one of the big objections to the use of power equipment. You would pay $700 or $800 for a saw, and it would be laid up three or four weeks for want of a replacement part.



MR. ROY: We have had those saws for a couple of years in our operation and even though we have a serviceman up there, we don't get one-day service as you suggested. I think in most cases, we have to wait a week or possibly ten days. However, I can't recall our having any accidents with those saws.

MR. HELBERG: That's right.

MR. ROY: This must be a different saw altogether from the one which Mr. Blackman was talking about. We haven't had any accidents.

MR. HELBERG: I have seen all types used. Some may have minor bad features—for instance, one saw can't be shut off and doesn't have a clutch and is constantly in operation.

The old lumberjacks in our area won't have anything to do with them. Younger men who are mechanically-minded are using chain power saws, and they are not as prone to accidents as an ordinary workman. The fellows who use them are a higher type of employee.

MR. A. W. NELSON: I remember one man who was running a crew of Choctaw Indians—a very highly integrated bunch who had been working together for quite a while. He was using a Mall saw and had taken the safety bar off of the back side of this saw in order to reduce pinching. They had cut through the tree and it began to fall. The man who was using the pike-pole to direct the fall of the tree didn't get out of the way. These Indians swung the saw out in a kind of rhythmic motion. Running carefully fast, they would run to a tree, saw into it, and then jerk out the saw. Having no guard on the back, it cut the fellow's leg quite deeply.

I notice that nearly everybody who uses that model Mall saw has had to take the bar off. It is a very unsafe thing, but is believed necessary to get any kind of production out of the saw and keep it from binding and pinching.

MR. HELBERG: Perhaps that saw is more designed for sawing timber where you do wedging than in hand sawing.

MR. A. W. NELSON: I think it is. In pulpwood, you don't have enough time to wedge. Your saw is through the tree before you can back it up with a wedge.

MR. HELBERG: Inexperienced sawyers get through the tree before they know it. Because the saw cuts so fast, you have no control over which direction the tree falls. It stands up and wobbles all around and sometimes falls opposite from what is expected.

MR. A. W. NELSON: There is another kind of saw (I don't know whether it is used very much up North) mounted on two bicycle wheels. It is a circular saw driven by three or four belts.

MR. HELBERG: They don't like that at all in our territory.

MR. A. W. NELSON: I think it is an extremely dangerous saw. I hate to say something that might react to the detriment of the people who manufacture it, but they have a half-guard which immediately chokes up with branches and things. I have never seen one that would work with the guard. I have never seen one with the guard on it.

MR. HELBERG: They would probably be all right in very flat terrain, but not where you have got rough going.

MR. A. W. NELSON: It takes a big man to pull one around. But there is danger in those saws. You make no undercuts. You just put the saw in the back side of the tree. A man stands with a pike-pole so he can push it in the direction where he wants it to go.

The saw pushes like a wheelbarrow. The handle gets through part way and somebody has to pull it out. When getting it out, he may back right into the man using the pike-pole. I understand some people have lost legs with them. We never checked on that.

MR. CROUCHER: My experience is that that is a hazardous way to fell a tree. I claim you can't fell a tree properly and safely without putting a scar or undercut in it.

MR. JOHN A. DICKINSON [National Bureau of Standards, Washington, D. C.]: They advertise that you can cut timber up to 12 inches without cutting or scarring.

MR. CROUCHER: I wouldn't do it. I would at least put in one axe cut so you have something to give when the tree starts to fall.



MR. HELBERG: The undercut is an important factor. When using power saws, men try to get away without notching or undercutting the tree in order to work faster.

MR. A. W. NELSON: I think that brings back the point that Mr. Blackman mentioned. Beginners may never know the right way if they watch a man who is cutting trees down without undercutting. They are liable to think that is the way to do it because there is an awful lot of people who fell timber up to 12 inches that way.

CHAIRMAN MINOR: This question is submitted by R. O. Helberg: "What type of safety program can we carry on for small jobbers where the operations are scattered, say, in groups of four to six and groups of 15 to 20 workers?"

MR. HELBERG: Both Consolidated and Mosinee have jobbers. I would like to have them tell me what we can do for them.

MR. A. A. WACHS (*Mosinee* Paper Mills Company, Mosinee, Wisconsin): We haven't done anything on it.

MR. A. W. NELSON: We have independent contractors who contract to deliver wood for so much a cord and over whom we exercise no supervision.

CHAIRMAN MINOR: Would you want to prepare a safety program for them or do you think they should go ahead and work out a program of their own?

MR. HELBERG: Every company operating is affected by the accidents of all the others. The largest group, especially in our area, is these jobbers or those who are not under supervision. Your companies are all paying increased compensation insurance costs because there is no safety program among that group. There is no doubt about it at all in Michigan where the logging rate is $14.72. That rate is largely based upon the operations of these small jobbers. I think that to reduce your costs, something should be done about it.

MR. A. W. NELSON: We attempted to do the same thing with education on the fire prevention. You know, we have an awful lot of fires in the southern woods. According to the interpretation of lawyers, you cannot have any dealings directly or indirectly with any one of the contractor's employees. Anything that is done must be done with the principal. We have attempted to interest the contractor in fire prevention. If he is willing—you can't use any coercion—he can get his employees together for a half-hour or hour demonstration on how to use fire tools and how to make simple preparations, etc. We usually bring in some official from the state or federal forestry service to give assistance.

A similar program might be arranged by getting someone from the state accident prevention department or somebody from the workmen's compensation department to work with you. You might hold an on-the-job meeting. Ask the worker to stop the job and give you a few hours so you can talk to him and explain some fundamentals.

MR. HELBERG: That would be pretty tough in an area where you have six men working at one place and six more working 22 miles away.

Would it be practical to take foremen, checkers, or scalers—those people who do come in contact with each individual operation, whether it would be four, six or fifteen men—and ask them to spend some time on safety while they are doing their work?

CHAIRMAN MINOR: I think you have something there, Mr. Helberg. Checkers and scalers are around the area checking on the contractors, and they are the ones who are in contact with them. I think they would be the ideal men in a lot of cases.

MR. HELBERG: Mr. Wachs from the Mosinee Company could train all the checkers and scalers he has out, and they could train their jobbers.

MR. WACHS: We don't have checkers and scalers, and our jobbers are mostly farmers. The wood is scaled when brought to the yard.

MR. OTTO HARTWIG (Crown-Zellerbach Company, Portland, Ore.): The one thing you need to bear in mind in connection with this is your involvement so far as wages and hours or other federal laws are concerned when you exercise any direct control over the contractor's operation with respect to safety.

I think, perhaps, the answer lies in reporting every one of the sub-contractors to the state set-up and getting the state to develop a system for educating the employees. I think Helberg's reasoning is sound. The whole industry pays the freight. I am astounded at the rate in Michigan. Our rate in Oregon is $7.50 for $100 payroll. We have just as large a number of those small operators called "gyppo" operators out West. We find we have got to be awfully careful, if we have established them as contractors to begin with, in order that we don't upset the whole apple-cart by involving ourselves in direction and control to a degree that will make them our employees.



MR. HELBERG: How can you control accidents suffered by gyppos?

MR. CROUCHER: You will get just as much resentment in trying to get scalers and checkers to educate the gyppos as you will find resentment among them if you send a safety man in to teach them how to do work that they have been doing all their lives. I have had for some time thought of penalizing these gyppos for accidents. They know all the safe methods. The underlying cause of their accidents is that they want to make money quicker. So if in your agreements with your gyppos you could penalize them in some way for making it cost you more for pulpwood by reason of having accidents, you might get somewhere. Or you would approach the problem from the opposite direction; you could give them a bonus for having a safe operation.

MR. HELBERG: That is right. Every one of these small independent contractors does his job the way he can make the most money, and when he finds out that accidents cost *him* money, and not the insurance company, then he is going to practice safety.

MR. CROUCHER: You might explain that usually gyppos do not employ help themselves. They are both the employer and the employee. Four or five men will get together and contract to cut a small piece of timber. They divide the profits or the wages or the contract price among themselves equally so they have no employee relationship among themselves.

MR. HELBERG: They are one of the largest factors in determining the base compensation rate. In Michigan the base rate is twice what it should be. The large companies, even after experience rating credit, are still suffering from gyppo accidents.

MR. A. W. NELSON: Did you say those men board at your camp?

MR. CROUCHER: Sometimes they board at the camp. Sometimes they have a little log shack, 12 by 16, close to the area they are working in. Sometimes they buy provisions from the camp. Sometimes they buy provisions from a grocer. They are strictly on their own.

CHAIRMAN MINOR: This question was submitted by either Mr. King or Mr. Henry. "Do changes in weather effect the number of back sprains?"

MR. HELBERG: Yes, they have—more so toward the spring break-up.

MR. A. W. NELSON. Do you suppose the questioner had reference to the effect of snow and ice?

CHAIRMAN MINOR: It is hard to say. Are there more back sprains, say, in the winter months of January and February when the weather is more severe or do you encounter them in the spring when you have sudden changes in the weather or in the fall?

MR. HELBERG: The only answer to that, that would sound half-way logical, other than the one I gave previously, is that when there is no snow on the ground, certainly the handling of pulpwood pieces would be a little more difficult if you are going to drag them than possibly where you can slide them on the snow. And if you are putting them on skids or onto a truck, you can slide them on the ice or snow that happens to be present. That might be the only difference in the weight of a piece of pulpwood, I think.

MR. G. S. NELSON: Isn't he referring to changes in temperature more than in footing?

CHAIRMAN MINOR: "Do changes in weather affect the number of back sprains?" It is not altogether too plain just what he means there.

MR. CROUCHER: That question could apply to any phase of any industry.

MR. G. S. NELSON: I was going to say I don't think we have as many back sprain cases in our logging operations as in the mill. Due to the change of weather at this time of year (Fall) we seem to have an influx of back sprain cases for no apparent reason. Maybe it is a draft.

CHAIRMAN MINOR: That takes care

of all questions that have been submitted. Now in front of us, we have a small sheet here with questions on it that we had drawn up.

The first question is: "Who gives the safety instructions to new employees in woods operations?" Now I think what was intended there was: Who should be responsible for instructing the new employees? That question naturally applies in all the industry no matter whether it is in the mill, up in the woods or just where it would be. Who, would you say, should give out the instructions to new employees?

MR. HELBERG: My answer has always been his immediate supervisor.

MR. DICKINSON: That depends largely upon the size of the plant and the set-up. If you have a big unit and hiring is done from the central office, it may be possible to give some general instruction at the time of hiring or shortly thereafter. But I think the actual instruction for his specific job is the duty of his foreman or woods boss or whoever is immediately over him, if they can do it. I think it should be done on the site.

When I spoke of a large plant with central education, I was referring to the fact that two or three years ago we had some very beautiful colored movies of logging on the West Coast. We had some from Washington and Oregon and one from British Columbia on the use of chain saws. Those films are shown out on the West Coast to new employees. They stress certain points that should be watched such as the use of hard hats and jumping clear of the wood and the removal of chain saws and things of that kind.

CHAIRMAN MINOR: Well, other than the general information you get in the way of posters and leaflets, you would say that the employee's immediate supervisor should be the one to give the instructions?

MR. DICKINSON: I think so. They do generally throughout our industry.

CHAIRMAN MINOR: Does everyone agree with that?

MR. ROY: In some camps, it would be almost impossible for the supervisor to hand out this instruction. For instance in our company we have a large turn-over of labor. We might have 15 to 20 men coming into a camp daily. To have the supervisor instruct them individually or in a group, would take a great deal of his time —more than he could afford.

I have suggested to our company that they organize an operational camp close to the woods office and use that as a sort of dispatching camp where the chap coming through, before going out to a standard operational camp, would pass through this camp and receive instruction. After he had proved that he could carry on comparatively safely and efficiently, he would be passed along to another operational camp. It is also a good idea to find out whether he is just floating around for two or three meals.

CHAIRMAN MINOR: Would you say it would be the strip boss's job to keep a watchful eye on the new man or would the duty fall to the camp foreman or the superintendent in the area?

MR. ROY: I think the most practical man would be the assistant foreman or, in some cases, the strip boss. Certainly he sees these men more often than the logging superintendent or the foreman. It would be far more practical for him to do something like that. Even at that his job would be a considerable one. I don't know whether he would be able to do it thoroughly.

CHAIRMAN MINOR: From your remarks Mr. Roy, I gather that you concur with what Mr. Dickinson has said—that it should be his immediate supervisor?

MR. ROY: It should be, yes.

CHAIRMAN MINOR: I think myself that that is the answer.

MR. HELBERG: I have seen only one large operation in which a regular safety supervisor was used. He was a fellow who went into logging after he had been in the contracting business. During the war the army encouraged the employment of safety supervisors to give instruction to individual men. That was how he happened to try that. But the men resented having someone other than their immediate foreman or immediate supervisor come in to give them additional instruction.

MR. AL JOHNSON [Kimberly-Clark Corporation, Neenah, Wisconsin]: I am not too familiar with woods operation but in our corporation, I don't think a safety man at any time should be instructing unless he occupies the dual job of safety man and trainer. That is the only time we have a safety man who does any training. Quite often in our smaller plants, the job set-up man is the safety man and safety trainer as well.



MR. HELBERG: In most large operations that I have seen, the safety man or trainer has his hands full training the foremen or supervisors for safety and conducting educational meetings occasionally for large groups.

CHAIRMAN MINOR: The second question is: "Are chain saws safe for felling? How can they be transported safely? What maintenance is necessary for proper safety? What about 'get away' on the part of the bucker?"

MR. DICKINSON: On the West Coast, almost all the big timber is now felled by power. Power is almost universal in the large timber. In the East, I don't think it is so common. But I believe the experience in Washington, Oregon and California has been rather good as compared to hand felling. You get away from working the men on springboards. They cut lower and get a longer log because the extra sawing is a matter of minutes rather than hours.

MR. RUSSELL POHL [Mine Safety Appliance Company, Seattle, Wash.]: I am from Washington and Oregon, and there the trend is definitely toward all power equipment.

MR. HELBERG: If you apply your first question, "Are they safe for felling?" to pulpwood logging, my answer would be: "Yes, they have proved safe in the hands of trained personnel." In our experience, looking over a large amount of logging, our frequency of accidents is less with the use of power saws. I don't know exactly what the figures are on severity.

MR. A. W. NELSON: The figure is less for power saws than for hand tools.

MR. DICKINSON: I think that is correct.

MR. ROY: That is definitely true in our company. We never see accidents with small power tools.

MR. HELBERG: My own opinion is that it is because of the difference in the caliber of the employees. It isn't the difference in the method so much as the difference in the type of employee who uses the tool.

CHAIRMAN MINOR: How can they be transported safely?

MR. DICKINSON: They are generally handled on trucks and have a cover or a sheet which covers the chain. They are heavier so you may have sprains or hernia.

MR. CROUCHER: In transportation in the pulpwood woods, you don't use trucks. You wouldn't get anywhere with trucks. You would have to clear a road for the trucks. They must be carried by hand. That is the question: How can they be carried by hand safely?

MR. HELBERG: Most two-man power saws have a handle at each end, and that is the way they should be carried. A distributor of the saws told me that most of the accidents he knew about were in transportation where a man grabs hold of the chain, usually wearing gloves, even though it might be six or eight or ten inches back from the handle. There is no reason at all why they can't carry them by the handles.

MR. A. W. NELSON: I have seen a guard made out of two pieces of old fire hose and two screen-door springs. The pieces of fire hose were put on top of the saw and the screen-door springs hooked around it so that no matter which way the chain was turned, it was covered. These are used when a man rides to the woods on the same truck with one or two of the saws.

MR. HELBERG: That would be for truck transportation, going to and from the job, but the handle is for going from tree to tree.

MR. HELBERG: I think there is less hazard in carrying a chain saw than in carrying a hand saw and an axe on the shoulders.

CHAIRMAN MINOR: What maintenance is necessary for proper safety?

MR. DICKINSON: Like any other saw, the teeth have to be kept trued-up and sharp. One trouble is a gradual combined stretch and wear on the links of the chain and a tendency to climb the sprockets. Before you reach that point, the chain should be discarded. You may break it. I have never heard of any accidents resulting from climbing. Those who have ridden bicycles have had the chains climb up and eventu-



ally snap because of slipping sprockets. I understand these saws have the same trouble although the manufacturers claim, I think, that it is several thousand hours before the combined wear and stretch is serious on the chains provided the chain is kept lubricated to cut down combined wear and stretch.

MR. A. W. NELSON: Mr. Helberg, have you ever heard of any chains flying off or flying apart?

MR. HELBERG: No, I haven't.

MR. DICKINSON: I haven't.

MR. A. W. NELSON: Usually it just falls off.

MR. HELBERG: The minute it breaks, it is locked into your cut, I would think.

MR. A. W. NELSON: It breaks and lays right in the track.

CHAIRMAN MINOR: Who is going to maintain the saw? Are you going to have the camp mechanic maintain it and check it occasionally, or are you going to leave it to the cutter?

MR. DICKINSON: That will depend on how far from base your woods operations are.

MR. A. W. NELSON: I think some specialist—the camp mechanic or somebody else—should be responsible for tuning the saws up every night or however often they need it because the average operator doesn't have the tools or the know-how.

MR. DICKINSON: Know-how particularly.

MR. A. W. NELSON: Some of these saws are temperamental. You get them out on a cold morning; the spark plug isn't just right; the magneto isn't set right; and you can wear yourself out cranking one up.

MR. HELBERG: You are going to lose a lot of time worrying about a specialist.

MR. A. W. NELSON: I don't mean a specialist in that sense. You take a maintenance man or factory man and give him the tools and show him the points to check on. Anybody who can work on an automobile engine or on an outboard motor and who can file and set teeth could look after those saws.

MR. HELBERG: Most of our operators up there insist upon having at least one good man in the sawing crew who can take care of the saw. They insist that the filing be done twice a day. I have noticed some which are supposed to be filed once every evening. You don't get economical cutting when you do it just once a day, I suppose. Other maintenance can be accomplished by that man.

MR. CROUCHER: Is it the practice to carry these chain saws to the camp each night or do they leave them under a pile of brush until the next day?

MR. HELBERG: In our country, the crew takes the saw with them. They take it into camp or home, depending on where they are. They take good care of them. A good share of the power saws used are owned by the crews. They maintain them and are not careless.

CHAIRMAN MINOR: What about "get away" on the part of the bucker? We are still talking about chain saws.

MR. DICKINSON: When bucking on a hillside, the man on the down-hill side may have to get out from under fairly quickly. I don't think he is in any worse position than the man on the end of a two-man bucking saw.

MR. HELBERG: You probably keep the power unit on the up-side and the other man lets go of the saw and gets out.

CHAIRMAN MINOR: "Where and how are hard hats used? Are safety-toe shoes required? Safety shoe pacs?"

MR. DICKINSON: Hard hats are generally used on the West Coast in heavy timber because of the danger of large branches dropping. They are used in driving caterpillar tractors, loaders and trucks and in practically any woods operation. I haven't seen them used too much in the East because the timber is smaller.

MR. POHL: The Washington State Department of Labor and Industry put into effect a code requirement that all timbermen—that includes buckers and sawyers and the rest of them—who have overhead hazards shall wear protective hats.

MR. CROUCHER: As regards the Great Lakes area, I wouldn't propose asking anybody to wear a hard hat in the woods. If you made it a rule, you would lose your crew. I wouldn't wear one myself. In the first place, you can't stand the cold with those things. If you are working in the summer and two or three mosquitoes get underneath the hat, you'll go crazy. It



doesn't seem to me the hazards are ever frequent enough—although they are severe enough when they do happen—to warrant putting such a rule in effect.

How would you feel, George, if your company would say: "Now you have got to equip all your men in the camps with hard hats and see that they wear them." What would your reaction be?

MR. POTTS: I wouldn't like it. I know that.

MR. CROUCHER: You wouldn't stand for it.

MR. HELBERG: Well, I have been pushing hats for 15 or 20 years. My predecessors have tried it with very little success, I will admit. We have countered arguments from the woodsmen, such as cold in the winter-time, by securing improved hats from various manufacturers. I think we have developed a cap that looks very similar to the cloth caps worn by the woodsmen to serve as a liner.

You always have the argument of not being able to watch the tree top because of the brim. So we have reversed the miner's hard hat to give neck protection from the visor and full vision in front. We have been meeting with success in giving them to men with chain saws. In fact, one distributor is selling two hats with every saw and the men wear them.

Recently at a logging congress at Ironwood, Michigan, I had two men tell me they have worn the hats for four months and they are going to continue to wear them. One of them said it undoubtedly saved his life. He spent a day in the hospital, but he figures his life was saved by the hat.

In pulpwood logging, I doubt whether there is very much hazard. The trees are spruce and balsam and small pine. But in heavier timber, there are hazards that warrant the wearing of hard hats.

MR. DICKINSON: In big hardwood, I don't think there is much question of the value. The question is on small pulpwood. You don't have the big branches for one thing and you don't get the famous "widow-maker" that they get on the West Coast—a dead hanging branch that drops 50 or 100 feet.

MR. HELBERG: One thing more: we are calling this hat a logger's safety helmet—not a miner's cap or a shipyard worker's hat. It is a logger's safety helmet.

CHAIRMAN MINOR: I think we will go on to the next question. Are safety-toe shoes required?

MR. DICKINSON: The size and weight of the log handled, it seems to me, would be the determining factor.

MR. G. S. NELSON: I would say recommended but not required.

CHAIRMAN MINOR: We will use the word recommended. Strike out required. Are safety-toe shoes recommended?

MR. DICKINSON: They will prevent a good many serious toe injuries. A safety-toe shoe must take a 2,500 pound load.

MR. G. S. NELSON: The one most frequent injury that the safety-toe shoe would protect you from is the axe slipping.

CHAIRMAN MINOR: Probably what they are getting at is the use of safety-toe shoes in the handling of the pulpwood—trucking and loading into cars.

MR. HELBERG: Most often, the objection that we have to the shoes is the matter of the extreme cold temperatures. We feel they are not practical for that reason.

CHAIRMAN MINOR: Not during the winter months.

MR. CROUCHER: In the Great Lakes area, they don't wear leather. They wear lumbermen's shoes. These shoes are made with the steel toe-cap inside the same as the others. The men claim that they draw the cold, but it is mostly a matter of imagination. I know that from trying them. I certainly think they should be recommended on those jobs where there is danger of falling wood. I worked 15 years in the woods unloading logs from horse-drawn sleighs. Although that kind of logging is probably the most hazardous for toes, I got only one toe smashed in 15 years.

CHAIRMAN MINOR: Then we could settle that by saying that we recommend that safety-toe shoes should be worn when and as practical?

MR. CROUCHER: I would qualify that and say: "Safety shoes or rubbers."

MR. HELBERG: How about a cap for the men on landings—a steel cap that fits over the top of the shoe?

MR. DICKINSON: That gives essen-



tially the same effect. It is a little clumsy and weighs a little more.

CHAIRMAN MINOR: Are you referring to the foot guard?

MR. HELBERG: Yes, it gives more protection. A lot of the injuries in handling pulpwood on landings occur further up the ankle.

CHAIRMAN MINOR: Do you think the harness on these is heavy enough? Quite often the harness snags on the side of a pulpwood stick with the result that it springs and slips off. We have had cases where they were more of a hazard than a help. Has anyone else encountered the same condition?

MR. JOHNSON: In this same meeting last year, we got into this same subject. An individual who was here from the Spruce Falls Power & Paper Company told about how an individual in that mill had, as a hobby, built a fiber protection all around the sides and over the toe of the shoe. If I recall, that individual presented pictures of how it was put on. They have found that this system works very satisfactory at Spruce Falls. If my memory serves me right, a year ago last January, they had 25 accidents in unloading in one month. This year, in the same month, they had none. I don't know whether shoes prepared in this way are used in the woods operation, but they are used where the log-handling is done near the mill.

MR. A. W. NELSON: We have a guard that goes all the way above a man's knee. It is a toe and instep guard and then has a guard on the shin and kind of a pad with steel mesh in it. It is used for unloading wood cars, in the woodyards and up in through the grinders where we had a lot of accidents from wood falling other places than on the toes.

MR. HELBERG: The film, "Safety in Wood Handling," that is put out, I believe, by Liberty Insurance Company and Brown Company in Berlin, New Hampshire, portrays that particular type of safety equipment. It looks like a hockey player's equipment.

MR. DICKINSON: Drownings make up a pretty high percentage of the total fatalities, but very few people are giving attention to it. We have had 21 drownings in a year. We recommend that at the loading pond at each mill two or more men work together so that if one falls in, the other knows it. There are now many life belt devices available. They were developed during the war, of course, for aviators and all navy men wore them on water operations. They never went out without them. One is the $CO_2$ cartridge type. They keep a man afloat for many hours.

CHAIRMAN MINOR: How many operate your own trucks?

MR. POTTS: We operate our own trucks.

CHAIRMAN MINOR: How about Spruce Falls?

MR. R[illegible]: It is pretty well divided. I would say the majority are contract-haulings.

CHAIRMAN MINOR: Do you have a system for routine inspection?

MR. POTTS: We do. They are checked over every weekend.

CHAIRMAN MINOR: What do you do at Spruce Falls?

MR. ROY: We haven't done a thing about it.

CHAIRMAN MINOR: Do you have printed safety rules for drivers?

No standard safety rules have been printed yet at Ontario-Minnesota, but I think it is leading up to that as the program is unfolding.

MR. DICKINSON: You can get a lot of material from the Truckers' Association in Washington, D. C. I had the privilege of witnessing their Truck Rodeo last week, which was held in Washington. They offer prizes for the best drivers of straight trucks, semi-trailers and full-trailers. A rather interesting thing was that the winner in the straight trucks was a man in his sixties and the runner-up was a 17-year-old boy. So age didn't make any difference.

MR. A. W. NELSON: Most of the state highway patrols have a set of printed safety rules that they issue when giving drivers' licenses. Those cover just about everything including any particular hazards in the states involved and any special climatic conditions.

CHAIRMAN MINOR: The highway rules would apply when you were hauling on any highway, but where you have your own company's hauling roads, you are encountering a different situation.



MR. HELBERG: You might be interested in a method that was used by a company which was not concerned so much with individual injuries to the drivers. This company had a fleet of trucks with which they hauled pulpwood, saw-logs, chemical wood and so on. When they made a check of their accident costs they found they had an average $100 cost for every load of logs involved in an accident during that year. They were hauling over all privately-owned roads except for about five miles.

They adopted a bonus for the drivers based upon a combination of production and elimination of accidents. Even though a man's production might be fairly good, if his truck was involved in an accident, he was eliminated from the bonus. They reduced the frequency of truck accidents by about 50 per cent in the first year.

CHAIRMAN MINOR: The next question is: "How are these trucks loaded?" In other words, how do you load pulpwood on to your trucks—mechanically or manually?

MR. A. W. NELSON: Most of the loading of individual sticks is still done by hand, but there are a few pulpwood loading conveyors that are now being manufactured. All it takes is one man up on the truck to straighten the wood.

MR. CROUCHER: You don't let the man stand on the truck. Doesn't he have a platform alongside of the truck on which to stand and straighten the wood?

MR. A. W. NELSON: No. The ones I saw, the man stands about one-third of the way up on the load. He just watches it dumping the wood, and he can stop the conveyor long enough to get it straight. He stands up on the part that has been loaded and the wood falls between him and the conveyor. He stands there with a hook or a sawed-off pike-pole and straightens it.

MR. CROUCHER: That is the way it started, but we provide a platform alongside of the truck where he can do the same job and be out of the way.

MR. DICKINSON: Does it take a lot longer handle?

MR. CROUCHER: Just the same.

MR. A. W. NELSON: Is that a portable stand?

MR. CROUCHER: Yes.

CHAIRMAN MINOR: On the slasher operation is the Patricia Area, they have one where the wood is coming from the slasher conveyor. The man, instead of standing on the load, stands to the side on a platform entirely out of any danger of falling wood. It works very nicely.

MR. HELBERG: I don't know what conveyors you are using. If you are using one with a slasher, it makes a great deal of difference as far as safety is concerned at what height it is elevated. If you start with an empty truck and put it up high, that pulls it down and that is hazardous. But that is not so if the platform is put at the proper level and raised as the load goes up. I never saw a man on the truck as they load them.

Mr. A. W. NELSON: In the South it is quite common to do that.

CHAIRMAN MINOR: We had a man standing on the load when he was straightening out the wood as it came off the loader and he sustained a very bad fractured leg. When the accident happened, he was rearranging the set-up between the loader and the truck and he was squeezed. He had been standing up on his truck straightening his wood, and if he had had a different method of straightening the wood, he wouldn't have been up there, so we are trying to keep away from standing on the load.

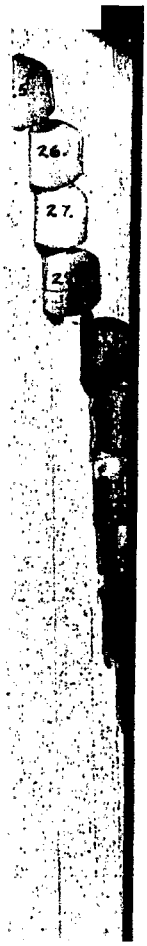
MR. HELBERG: I saw a new type of skid-loader mounted on a tractor. Your cutters pile logs in bunches. Then this loader comes along like a big hand and reaches over and grabs your pile, swings it around and loads it on to the truck. With it one operator has put 1,300 cords of pulpwood on a truck in a day.

CHAIRMAN MINOR: One more question. "What safety precautions are used in blocking wood?" We are still on Pulpwood Trucks.

MR. A. W. NELSON: Down South the wood is loaded first in stacks. The stacks are left on the truck all the time and the load is bound in with a log chain and a binder.

CHAIRMAN MINOR: Do you use center stacks?

MR. A. W. NELSON: Somewhat. The contractors who deliver to the International Paper Company have the load blocked off



with center stacks into three compartments. They unload it at the mill with a crane and slip the cable down where these stacks are. But most other mills have only two to two and a half cords on the truck and they just hold the load.

CHAIRMAN MINOR: How does Spruce Falls do it?

MR. ROY: There are stacks on the rear and chains coming over to the front.

MR. DICKINSON: Are dump trucks used in pulpwood work?

MR. HELBERG: I have seen a few platform dump trucks.

MR. POTTS: We use some of those trucks.

MR. HELBERG: These trucks are mostly used by contract haulers. These haulers have a hoist mounted on their trucks which they use for loading. They have a chain that runs underneath, and they use the hoist to grab the chain. When it pulls up, all the pulpwood is off.

MR. A. W. NELSON: The International Paper Company has a truck dumper at one mill. They drive the truck on a rack, chain the wheels down, and the rack is tipped endwise at a 45-degree angle with a hydraulic cylinder and the wood falls off into the conveyor.

MR. HELBERG: Just a week ago, I ran across an accident where in knocking out the stacks, the bottom one stuck and didn't go out. It was on an incline and when it went over, the truck and the whole works went over into the pond upside down.

MR. DICKINSON: Before adjournment there is one thing I would like to say. The Logging and Sawmill Code is now undergoing revision. The Paper and Pulp Code refers the logging and woods operation to the Logging and Sawmill Code. We are very anxious to get a cross-section of pulpwood logging because, in many cases, as this discussion today has brought out, pulpwood logging is quite different from timber felling. As a general thing, it involves lighter and smaller stuff. We would like to get two or three men on that committee, representing both Canada and the United States.

I want to get only competent men who are particularly interested in just such things as we have talked about here because the whole logging picture has changed in the last 25 years. Comparatively the sawmill hasn't changed since mechanization in handling. The band, header, edger, turner, slasher and collar saws are pretty much as they were about 25 years ago except that they are a little bigger and better. The real change has been in felling and transportation.

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# Pulp Manufacturing

(A Round Table Discussion)

*Conference Leader and Expert:* JULIUS A. DRAPER, Director of Safety, Consolidated Paper Corporation, Ltd., Grand'Mere, P. Q., Canada.

*What experience have you had with foot protection for wood handlers outside under winter conditions, particularly men using wood hooks and pickaroons?*

Discussion: We tried to get men to wear Sankey foot guards over whatever type of shoes they regularly wear, but the men claim that the foot guards are too cold. Our rule in summertime is that the men must wear either safety shoes or foot guards.

Another member stated, "We have a rule in our company that in summertime men must wear safety shoes."

Another member stated, "Our men wear Sankey foot guards and shin guards both winter and summer when unloading cars. We have had complaints that safety shoes are too cold, but never that the foot guards are too cold. Foot guards are easy to take off and put on and the men do not mind taking the time to remove them to clean out any snow which accumulates. As a matter of fact, they absolutely refuse to work without them."

Question: Is it true, then, that your men wear *them* when actually working out in the snow? Answer: Yes. They wear them at all times.

Another member stated, "Our men wear them when working in the cars, both summer and winter but do not wear them under yard conditions where we have snow. We do not require them to be worn when working on the block pile—just when unloading cars."

Question: Don't you find it hazardous to unload wood *from* the block pile? Answer: No, we do that all by crane. The only time our men have to get in or near wood under these conditions is when cleaning up, and then the piles have been removed and there is not much possibility of wood falling on them.

A member asked, "Is this hazard with respect to the cold penetrating the shoes or the foot guards a real or fancied hazard?" Answer: "I think it is fancied. There is not enough metal to draw the cold if the shoes are large enough and the men wear good socks."

A member from the West stated, "We do not have cold weather out there, but when we introduced safety shoes, the men complained that they were cold. We feel that this is merely a mental condition."

Another member stated, "I proved this by interchanging plastic and metal-toed safety shoes. When they thought they were steel-toed, the men thought the shoes were cold."

Question: "In the Sankey foot guard, you have a plate that goes under the sole of the foot. How do you overcome the slipperiness there?"

A member from Canada stated, "We made our own toe protection. We have teeth on the edge and use rubber straps, and find it satisfactory. This came as part of the employe suggestion system."

To sum up, Sankey foot guards furnish protection and can be made satisfactory both for inside work and for outside work in the cold. We also have taken the trouble to introduce shin guards and have found them to be effective.

*How do you protect the feet of men using pickaroons at floor level?*

Discussion: As a result of our experience on the charging floors where men were getting hit on the foot by pickaroons, we lengthened the handle of the pickaroons and eliminated the trouble.

One member stated they used Sankey foot guards, but there is a vulnerable spot just behind and above the guard. They are experimenting with a heavy leather spat for this protection.

Another member stated that he felt that training in the use of pickaroons was the essential answer to this problem. He stated, "We have an old lumberjack who never breaks in a new man with a pickaroon. He gives this man a hand axe and has him chop with it until he is able to hit the same spot over and over. After that, he lets him use the pickaroon."

Another member emphasizes this point, saying, "This point of training and supervision is probably just as important as personal protective equipment."

To sum up, I would suggest that those of you having pickaroon accidents look into the matter of the length of handle used and also check to see that proper training is given and that supervision follows up.

*Do winter changes affect the number of back strains occurring in your plant, and if so, what may be done to control it?*

Discussion: In the West, we have a very damp climate. We have lumbago and sciatica conditions which are often diagnosed as strains. Most of these occur during November and February. I think we'll all agree that in many cases these are found on the lighter forms of work and not on the heavier jobs.

Another member stated, "We have noticed the same thing at our plant. In the Spring and Fall there is generally about a month when we have about as many as we have the rest of the year put together. I feel that these result from rheumatic conditions and not from work. We had one man who during about three weeks each year complained of a back condition. His family doctor told him to have his teeth out and since then he has had no back trouble."

Another member stated, "I have followed this for many years and have seen many peculiar cases. What we try to do is to ask each employe whether he has a cold and direct him to get proper treatment from our nurse. We feel definitely that the supervisor can do something to counteract back strains particularly when they order





men from inside work to outside work where it is cold. Supervision must see to it that these men put on extra clothing to keep from becoming chilled. It is also important to teach correct methods of lifting."

To sum up, it is agreed that proper training in methods of lifting is essential. Close medical supervision will assist in proper diagnosis and the elimination of these cases, or at least properly catalogue them. Also, men must be instructed to put on heavy clothing when going from warm inside conditions to work outside in the cold.

*Which practice would be more foolproof, leaving blow valve keys with digester cook or leaving the keys near the blow pit covers and having the keys fastened nearby to make sure that the wrong pit cannot be opened? Would this prevent the cook from giving out the wrong key?*

Discussion: A man was seriously injured in our mill when he opened the wrong valve.

Another member stated, "We had a similar incident that blew liquor into our steam lines and shut us down for four days. We had a check valve, but it failed to work. The liquor didn't reach the turbines or boilers. Oversight on the part of one of the operators was the cause. We have since tagged each line (40-pound and 150-pound lines) and see that the sequence is followed. This cost us almost $500,000 and, as I said before, shut us down for four days."

Another member stated, "Our accidents on the digesters are not so numerous, but they are severe and costly. We have installed telephones between the blowing floor and the digester floor."

To sum up, there does not seem to be any perfectly foolproof method of overcoming this hazard. We have installed a speaking tube between the digester floor and the blowing floor. Our experience has been that we have never had a very serious injury in this department. Perhaps with 26 digesters, we are overlooking what can be a very serious hazard.

*Does this group think that an acid-maker should work alone at any time of the 24 hours of the day?*

Discussion: In our plant we have a man alone, but he has an alarm system which rings in the digester department, if he gets into trouble. All he has to do is hit a button with his hand.

Another member stated, "We have a man in the acid plant and the cook contacts the acid-makers once each shift. The acid-maker helper makes the same contact at least once each shift."

Another member stated, "We use a telephone system to keep contact several times a shift."

To sum up, the chemical pulp department is unusually large, with very few men working in these locations. While men have to be alone, at least temporarily, there must be some means of communication or method of sounding an alarm in order to provide aid for them.

*In the Kraft process, what precautions can be taken to eliminate pink eye, which is encountered when re-tubing evaporators? Fumes cannot be entirely removed by steaming.*

Discussion: We don't have any answer to this problem, but we do find the same eye irritation. Masks, respirators and goggles have been tried out, but they are not the complete answer.

Another member stated, "We did not have this occur in our plants."

Another member raised the question whether or not this eye condition might be due to an allergy, and if so, the only answer is to use men who are not irritated by the condition described.

One plant recommended that the worker wear a large hood with a forced-air mask so that the man is breathing pure air while working on this type of job.

*The conference leader passed around some photographs of a new wood unloader which was developed by one of the southern mills.*

Discussion: The plant that devised this mechanism states that they save four men per shift and are now using two men for unloading flat cars of wood instead of six. This equipment consists of a large flat plate hung on the boom of a crane, to which a cable is installed. The crane is swung behind the load, the cable is wound up and the large plate pushes the wood off the car.

*We have had some severe injuries by men using pickaroons while working on conveyors. This is particularly true where the men are working fairly close together. We have heavy leather gloves for the men to wear, with metal protection, made of galvanized iron, across the back. How do you eliminate these injuries?*



One member stated, "Men working on slasher tables sometimes stick one another as they work close together. One answer to this problem is to have the pickaroon sharp so that it penetrates the wood and does not slide off." He further stated that they use shielded gloves and leather wristlets (which they buy from a safety supply firm), and which have given them lots of protection.

Another point was brought out: Men should not work directly opposite each other across the conveyors. For maximum safety they should be spaced four or five feet apart.

To sum up, pickaroon injuries can be eliminated on these locations through proper engineering, the use of correct protective equipment and through proper job safety instructions. In the North, it was pointed out that during the wintertime pickaroons are made slightly dull and when stuck onto the frozen wood, have a tendency to hold much better.

*What are some of the members present doing with respect to slipping hazards on wet floors?*

Discussion: We have made use of material called "Safety Walk." This has to be put down on a perfectly dry surface. Our experience has been very satisfactory. We have had some in service for two years and it is still good.

Another member stated they were using a liquid called "Armor Deck" on concrete. It's very cheap and easy to apply. It is supplied by a firm in Vancouver.

Another member stated that they had not found any type of abrasive paint satisfactory but have had good results with a type of surface that is trowelled on about 1/16 of an inch thick. On new construction, however, the grit or abrasive is placed in the top surface of the concrete.

To sum up, abrasive paint, an abrasive in a bituminous mixture, or "Safety Walk" have been found satisfactory and supply very good walk surfaces under wet conditions.

*Has anyone had any experience with vibrators on chip hoppers?*

Discussion: We have just installed vibrators and they work very well. These are on the side of the metal bins and this speeds up filling time considerably.

Another member stated that they were working with two vibrators, one on either side of the bin at right angles, and that the test has been very satisfactory. They are considering using them on other chip bins.

*Does anyone here issue ear plugs to employes in noisy locations?*

Discussion: One member stated that they had a couch roll which gives off a high frequency sound that is very irritating, so they have been giving out ear plugs.

Another member stated, "Unless this type of thing is handled by the medical department there can be an element of public liability and not a matter of compensation. A similar case regarding protective cream not issued by a doctor, is up before the courts of Ohio. We must be certain that we have the doctor in on dispensing this type of thing."

To sum up, as we build new paper machines, we know that they will be lots faster and this sound problem will become increasingly important in all of our plants. We trust that this hazard and the outcome will be discussed in the *Newsletter*, and we may have the benefit of this experience through this medium.

*We have Cottrell precipitators. From time to time they need servicing. At such times the men must go inside them. What, if any, are the gases present that might be harmful, which must be guarded against?*

Discussion: All you need is dust protection. Of course, you must be certain that the electricity is cut off. Respirators or a fresh air hose mask are all that's necessary. Also, we must furnish employes doing this type of work with special clothing, as the dust penetrates and when mixed with perspiration, causes skin irritation.

Another member states, "We have had a large precipitator in for nine years and I, personally, have been in and out of the room many times and this question of dust protection has never come up."

To sum up, work in cleaning a precipitator is not hazardous, and a dust respirator and special clothing are all that is required.

*Do you get much trouble from stock burns and flying stones on the old-time pocket guards?*



Discussion: We did at one time but we got around it by having doors made on all the pockets, worked by counterweights, and issuing instructions that before opening them, all hydraulic pressure must be cut off. We must make sure that the door is closed before any pressure is put on. For this, we depend on the grinderman. As we use artificial stones, we do not have any chips or broken places in the stones to cause extra stock to fly. All along, we have found that this has worked out very satisfactorily.

## Paper Manufacturing

### (A Round Table Discussion)

*Conference Leader:* ARTHUR CARLE, Safety Director, The Northwest Paper Co., Cloquet, Minn.

*Conference Expert:* WALTER A. GLEASON, Safety Director, Hammermill Paper Co., Erie, Pa.

CHAIRMAN CARLE: Julius Draper would like to know how aluminum core shafts are making out on big machines. The Gatineau Mill of the Canadian International and the Donnacona Paper Company have been using these shafts for at least 18 months with complete satisfaction. The Port Alfred Mill installed aluminum core shafts on a 234" news print machine three months ago. The steel shaft weighed 450 pounds; aluminum shaft weighed 150 pounds. The winder crews and the boss are enthusiastic.

MR. C. J. KEARNEY [O & M Pulp and Paper Co., Kenora, Ont., Can.]: The O & M Pulp and Paper Company is using aluminum shafts and finds them very satisfactory.

MR. W. B. RAMSAY [Kimberly-Clark Corp., Niagara, Wis.]: Kimberly-Clark Corporation found that the aluminum shaft kinks very easily, thus giving trouble getting them in and out of cores.

MR. D. J. BRETT [National Container Corp., Jacksonville, Fla.]: The National Container Corporation thinks the answer is handling of the shaft rather than the material of which it is made.

MR. J. FRED BERRY [Alton Box Board Co., Alton, Ill.] The Alton Box Board Company handles shafts on a machine trimming 218" with air lifts, so that the roll travels out of the shaft.

MR. RAMSEY: Kimberly-Clark Company uses a truck that elevates and moves the shaft in or out of the core.

MR. GLEASON: The cost of aluminum shafts is excessive and they will kink. They have not been in use long enough to determine whether or not they are practical.

CHAIRMAN CARLE: On our winder shafts, we place a notch 1/16" deep about three feet in from the end of the shaft and paint this red, so that the operators are warned that the end of the shaft is approaching as they remove it from the roll. What percentage of your employees wear safety shoes and do you require them to wear them?

MR. H. J. KROLL [Blandin Paper Co., Grand Rapids, Minn.]: After an employee drops a shaft or something on his foot, he gets safety conscious and secures safety shoes. About 80 per cent of our employees wear them. New employees may have dress shoes that they wish to wear out so they are not required to purchase safety shoes.

MR. KEARNEY: The O & M Paper Company has 1,800 employees. About 95 per cent of the men wear safety shoes which are purchased at wholesale, the company paying 50 per cent of the cost. Each employee is allowed to purchase a pair of these shoes every 90 days if he so desires.

MR. H. T. HEBERT [The Flintkote Co., New Orleans, La.]: The Flintkote Company gives $1.00 towards the cost of safety shoes purchased by the employees.

MR. H. B. GOODRICH: [Strathmore Paper Co., West Springfield, Mass.]: My Company requires all new male employees, as a condition of employment, to agree to wear safety shoes. They sign this agreement when making application for work. Safety shoes are carried in the mill stores, and the employee is permitted to pay for them by weekly deductions from his pay check. The company feels that the wearing out of dress shoes at work is a poor policy and the workers' feet should have the best possible protection during working hours. It would like to require all old employees to wear safety shoes, but does not see how this may be done.



MR. GORDON E. ALLEN [Wood Conversion Co., Cloquet, Minn.]: The local stores stock safety shoes. The worker is given a requisition by the supervisor, permitting the worker to purchase at wholesale prices a pair of safety shoes. The company feels a better fit is assured them by carrying shoes in its own stores. At the end of the month, the local stores bill the company $1.00 for each pair of safety shoes supplied on requisition, returning a carbon copy of the requisition. Approximately 30 per cent of its employees are wearing safety shoes.

CHAIRMAN CARLE: How many paper mills in the State of Wisconsin are operating winders without their front nip being guarded? This question was asked by the National Container Corporation. They have made up a guard but do not use a hoist to lower the roll.

MR. KEARNEY: We use a guard which goes up and down by merely turning a handle. We also have two guards which are suitable for use on winders where shafts are dressed on the table, but which are not satisfactory when shafts are dressed on the winder. (A print of a guard for this location may be obtained from Mr. E. P. Marconi, National Safety Council, Chicago.)

MR. O. R. HARTWIG [Crown Zellerbach Corp., Portland, Ore.]: We have a manually-controlled guard on the winder which will take care of anyone getting caught in the back nip or the front nip.

MR. GLEASON: Be sure to have a safety sign on each side of the guard stating that it must be in position.

MR. KEARNEY: We have a guard that raises over the frame of the winder and does not hinder when the roll is taken out. We have pushers that push the roll out.

MR. KROLL: We use counterweights for raising and lowering the guard.

CHAIRMAN CARLE: Is there any safety device that can be put on the front reel to prevent the air hose from going into the nip? The paper, when being moved from the reel to the winder, picks up scab around the drum. The men take an air hose to run this scab off. The hose goes between the nip, and the man's hand follows the hose.

MR. GLEASON: Our engineering department is working on a rope carrier so that this operation will not have to be done by hand.

MR. EDWARD LUM [Beckett Paper Co., Hamilton, Ohio]: Our dryer spears are thrown on the floor on the front side of the dryers. Where do you keep yours?

MR. GLEASON: Hangers are provided on each side of the dryers near the floor.

MR. KEARNEY: Little brackets are attached to the hoods to hold spears or pike poles.

MR. HEBERT: We have a rack along the catwalk.

CHAIRMAN CARLE: Do you have trouble with slivers from spears?

MR. RAMSEY: Kimberly-Clark has been using magnesium tubes 1¼" in diameter. They are light and do not sliver. We found them very satisfactory.

MR. J. N. CONAWAY [Scott Paper Co., Chester, Pa.]: We use a bamboo pole and, it has proved very successful.

MR. LUM: What is a good way to eliminate spitting on the floors by workmen?

MR. F. A. WAGNER [The Mead Corp., Chillicothe, Ohio]: The Mead Corporation has a box of saw dust in corners and at the bottom of every stairway. This system has been very satisfactory.

MR. GLEASON: Painting the corners white works until they get dirty.

MR. HEBERT: Does anyone have a type of guard to prevent burns from radiant heaters when the sheet breaks while a man is standing under or near the last press? (No one had any experience on this point.)

MR. H. P. HUEBNER [The Flintkote Co., N. Y., N. Y.]: I believe that another division has overcome this trouble and will take the matter up with Mr. Hebert.

MR. R. W. CROUCHER [M & O Paper Co., International Falls, Minn.]: So you believe that the use of an air hose to clean dust off clothing to be hazardous enough



to prohibit such use? If so, how do you enforce the rule?

MR. GLEASON: You should put on air control valves so that pressure is kept below 20 pounds.

MR. ERNEST DUTCHER [The Flintkote Co., Los Angeles, Calif.]: As a safety rule, designate spots all over the plant where a man is permitted to clean his clothes with air. The nozzle has a screen, and pressure is kept to 20 pounds. Anyone cleaning at other than these stations is first reprimanded and then other disciplinary action taken if infractions continue.

CHAIRMAN CARLE: How many plants are using gasoline to clean felts? (Most do.) This is a serious problem as most solvents have a flash point that is dangerous and also dermatitis may occur. With carbon tetrachloride an employee may be overcome by fumes especially if there is heat present.

MR. DUTCHER: Do you have any recommendations for guarding nips on machine calenders?

(Mr. McAfoos was present and explained his threader which will soon be installed on a machine at the Alton Box Board Company.)

MR. DUTCHER: For about seven years Flintkote Company has used a paddle for feeding paper into the nip. Since that time, no accidents have occurred at this point.

MR. CARLE: Wet floors and steps account for a large portion of accidents around the wet end of the paper machine.

MR. DUTCHER: We use roofing paper on the floors and steps. This lasts for several months. No adhesive is needed when applying it. Several companies are using SAFETY WALK on cat walks and steps around the paper machines with satisfaction.

MR. GLEASON: We had a bad accident on a save-all machine. The man climbed up on the edge of the machine (made by Improved Paper Machine Corp., Nashua, N. H.) about 3½ feet above the floor level, and was caught by the breaker roll and his leg was broken. He was trying to clean out the shower lines some of which are fed by fresh water and some by white water.

What hazards or dangers have you experienced with hydrapulpers?

MR. J. H. SINCLAIR [Kalamazoo Vegetable Parchment Co.]: We have had some difficulty with the wire on bales. Truckers bring the bale to the hydrapulper. The wire is nipped and flies back, hitting the fellow in the head or eye. Men are not required to wear goggles.

MR. KROLL: Blanding Paper Company uses wire nips and goggles. Some mills allow wires to go into the hydrapulper.

MR. G. W. BRYAN [Sorg Paper Co., Middletown, Ohio]: Sorg Paper Company uses a lift truck to bring the bale to the hydrapulper where a skip hoist lifts it up. Before the bale is dumped into the skip hoist the operator nips the wires on the backside of the bale.

CHAIRMAN CARLE: Has anyone a goggle program for workers on the lay-boy and cutter in the finishing room? Sometimes a sheet of paper or broke will be pulled from the hoot and thrown behind the operator and in doing so, it brushes across their faces and often cuts the eye.

MR. BRYAN: After experiencing such an accident, we ordered safety goggles for this location. The operators complain they were too heavy. We now use plexiglas shields.

MR. GLEASON: A good rule to follow is that the lay-boy be lowered until it is not in a direct position before the face of the operators.

MR. C. M. WATTS [Michigan Carton Co., Battle Creek, Mich.]: Accidents occur mainly because lay-boy is about on the eye level. If a person wears ordinary glasses, that is sufficient protection. A lightweight spectacle goggle is all that is necessary.

MR. WAGNER: What do some of the other plants do about safety prescription glasses?

MR. HEBERT: The employee pays for his prescription and for his glasses.

MR. BROWN [Ontario Paper Co., Thorold, Ont., Can.]: Ontario Paper Company started a program in the machine shop. Asked the men if they would wear goggles and they were 100 per cent willing to do so. Management is footing the entire bill. Employee goes to any doctor he chooses. Now other departments are requesting the same privilege. Re-examinations will be given every two years. Number of employees is 1,300.



MR. WAGNER: The employee pays for his prescription and the grinding of the lenses. The company pays for the frame and the case and replaces broken glasses with safety glass at no cost.

CHAIRMAN CARLE: What safety methods do you use in handling rolls of paper? Eastman Kodak handles rolls automatically with electric trucks.

MR. WAGNER: Our electrical department inspects all cables every week (lift and electrical cables).

MR. G. R. LEONHARD [Paterson Parchment Paper Co., Bristol, Pa.]: Sometimes an employee will pull a roll from bottom of pile, so that other rolls fall where they might cause an accident. Proper method, of course, is to pick the top roll up and set it aside. We have placed barriers so that this practice cannot be continued.

CHAIRMAN CARLE: How do you select and train truckers in the finishing department?

MR. DUTCHER: Flintkote Company licenses operators of trucks the same as the operators of motor vehicles on the highways are licensed. No unlicensed man is permitted to move these trucks. They have about 300 licensed operators.

CHAIRMAN CARLE: Northwest Paper Company has prepared a booklet on the safe handling of trucks. Trucks are periodically tested including hand-lift trucks. Employees are not permitted to ride transporters.

MR. DUTCHER: Flintkote Company has a driver's report card which is turned in each week. The operator has the privilege to refuse to operate his truck if it is not in operating condition. The safety department tags the truck out of service until the maintenance department has put it in proper condition. The truck cannot be operated while the safety department's red tag is on it. The speed limit is four miles per hour in the plant.

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## Paper Products

**(A Round Table Discussion)**

*Conference Leader:* H. H. ADERHOLD, Personnel Supervisor, Marathon Corporation, Menominee, Mich.

*Conference Expert:* G. J. BIENVENU, General Superintendent, Container Division, Gaylord Container Corporation, Bogalusa, La.

CHAIRMAN ADERHOLD: The first question submitted is: "How do you get your union organization to help in your safety program?"

MR. OTTO HARTWIG [General Safety Supe[illegible], Crown Zellerbach Corp., Portland, Ore.]: I might be able to make a contribution here, gentlemen, by saying that the twenty-six labor organizations of the plants on the Pacific Coast, that means the Pacific Coast Association of Pulp and Paper Manufacturers, and the International Union, made application for an extension of the safety program that has been in effect in the various mills on the Pacific Coast, and out of that has grown a relationship that has since continued, and the plan developed was this: That there would be a joint employer-labor safety conference each year in three of the west coast states, Oregon, Washington, and California.

The employers agreed to reimburse the union delegates who attended, for two days' time while attending the conference.

The union delegates are made up of one representative from each union in each plant. Thus, the largest number of delegates that would come from any one plant would be two, and it is those two official delegates that the employers agreed to reimburse to the extent of two eight-hour days. The unions select them and take care of their travel expense and hotel expense. Thus, there is no direction or control or involvement in wages and hours which you boys may be thinking of. They are not being paid, they are being reimbursed.

The plan provides for equal representation from employers at these annual meetings, and, of course, the employer will pay his own delegates or representatives.



Besides the regular delegates, both from the union and the employers, each side may have as many guests as it cares to send. Of course, the unions, if they send guests, pay for their own guests, that is, pay their wages, presumably, and take care of their expenses.

That program has been going on now for two years. Just as soon as I get back from the east here, we begin the second or third series at Tacoma, Washington on the twenty-eighth and twenty-ninth of this month. Approximately two weeks later, we will hold the next meeting in Salem, Oregon, and then in early December the third one in Los Angeles, California.

The program agreed upon provides for a general discussion of all factors vital to safety. They discuss frankly all items that might serve as barriers toward developing a better safety program, but it is an absolute unbroken rule that no subject of plant nature be discussed at these conferences. Thus, the discussions that take place must be, to a large extent, academic, that is, they may revolve around a problem or practice that this or that individual may have observed at the plant. But they must not say that "in our plant here at X Y Z we have this problem," and argue back and forth. That's out completely, and, I think, to a large extent the success of those conferences is due to the theory that those things should be settled at plant level and not brought in there for a public washing. As a result you do not burden a lot of people, who don't know anything about that local problem, and you have quieted down any possible conflict.

I will say that these plans have worked wonderfully well.

There are two co-chairmen for this group, one representing labor, and one representing management or the employers. I represent the employers.

We also bring in outside speakers. Last year we brought in Mr. Ned Dearborn to address the gathering at Tacoma, and it probably attracted close to 180 or 190 delegates, both the official delegates as well as guests.

Some of the companies nearby had half of their supervisors attend one session one day and the other half the next day's session. The companies figure they certainly benefited from that experience. The frequency rate in the pulp and paper industry in the Pacific Coast since those meetings in Washington and Oregon and in California, has been cut in two.

CHAIRMAN ADERHOLD: How do the union delegates from your own plant help the safety program after they have been to these meetings?

MR. HARTWIG: Well, it seems like they have been needled to action. They are getting the spirit. They come away from those meetings, to a large extent, I would say, chastened from the narrow viewpoints that they had before, and with a feeling of broader responsibility.

MR. BIENVENU: Mr. Hartwig, does the delegate become part of your Safety Committee, or do you depend on him to work strictly through the union channels?

MR. HARTWIG: There are no strings attached to the selection of the delegate.

If they were a bit cold at the time they were chosen to go to this conference, they come back with the desire to get in there and play ball. They may not have had any experience on the safety committee before, but they come back inspired to do something about it.

Quite a few of them have had safety experience, but there is no requirement that they must have served on a safety committee.

As I said before, the union in the plant (or the two unions) makes the selection. Of course, the international representatives too sit in on those conferences.

CHAIRMAN ADERHOLD: Then they are supported that way and that makes it official?

MR. HARTWIG: That's right.

CHAIRMAN ADERHOLD: Perhaps some of you people have developed in your own plants some plan in which the union actively cooperates? If you have, I would like to hear from you about that plan.

MR. GUNNAR HULTMAN [Managing Director, Pappersmassesforbundet, Stockholm, Sweden]: We have about the same plan as the gentleman over there. The union representatives run the safety business.

I am the president of the union, and I have been running the safety committee for two years. We have had considerable success, and I think men from the union should run this group. The members of the committee are chosen by the chairman of the union in cooperation with the supervisor. Every six months half the committee changes. Everybody has a chance to participate in this way. The system has worked for us.

CHAIRMAN ADERHOLD: What does your committee do, discuss the hazards in the plant—conditions and methods?

MR. HULTMAN: Yes, and if they have had accidents, they must do something about it before they're reported. We want the cooperation from the men. When we started this it was pretty hard, but now we have good results.

CHAIRMAN ADERHOLD: Does management work with you on that committee?

MR. HULTMAN: Yes, we have seventeen men, one from each department, and the supervisor runs the whole business, of course.

CHAIRMAN ADERHOLD: Is your committee composed predominantly of men below supervisory level?

MR. HULTMAN: Yes, but we have very good cooperation from management. Cooperation from management and from all the superintendents is very important. We had trouble with the superintendents last year, but this year we have very good cooperation.

MR. BIENVENU: Those are two well-organized groups Mr. Hartwig and Mr. Hultman have described. I know of several plants that have the union supply the committeemen, and, of course, the committeemen work under the safety director, but as they change every two months, they will put a new one in, or two new ones, depending upon the size of the group. The union furnishes that committeeman, and it is acquainting them with the realization that they are responsible for safety, too.

CHAIRMAN ADERHOLD: Now, if that is satisfactorily answered, we will go on to the next question. "The recent Brach candy company explosion in Chicago brings up the question: How dangerous is the accumulation of paper dust in our industry?" and the question refers to box plants for fabrication and converting. Have any of you made any studies on that or had any experience on paper dust as a hazard?

MR. BIENVENU: I think it is definitely a hazard. We have had slight explosions on our corrugators where an accumulation of dust had been allowed to remain. We have had a welder strike his lighter and the whole thing go up in a blaze. While it wasn't too serious, and there was no injury, there could have been.

So every week our corrugators and all the beams around there are blown off with compressed air to prevent a recurrence.

CHAIRMAN ADERHOLD: Has anyone else had any experience with that? It is possible that paper dust, being fibrous, may be a little less finely divided than such things as starch dust, and it may be that is one of the reasons why we haven't had that experience. I imagine some of the plants doing printing use starch also. Have you had any experience along that line, Mr. Kemp?

MR. C. H. KEMP [Safety Director, Thilmany Pulp & Paper Co., Kaukauna, Wis.]: We haven't had any trouble.

CHAIRMAN ADERHOLD: I have a question here as to how to prevent slippery floors around the coating press section of paper machines.

MR. JOHN MEINHARDT [Director of Safety, Gaylord Container Corp., St. Louis, Mo.]: We have slippery floors around the corrugators. I think everybody has that problem. You can use commercial non-slip materials. There are several on the market that do a good job. Abrasive treadways and walkways around machines that are involved will almost eliminate that hazard. I think you are all familiar with those floor materials. I think Minnesota Mining makes one. There are some that you can brush on, and some that you have to glue on in flat sheet form.

CHAIRMAN ADERHOLD: Have you found that the abrasives wear off and get in the machine bearings?

MR. KEMP: At the present time on our Number Eight paper machine we have a walk on our glass dissolvers on the back end, the wet end of the machine; because of conditions that are normal to every manufacturer on that type of machine, we have a constant oil and water hazard, and shortly after January 1, 1946, we had a new walkway made. Before it was put in position, we applied a non-slip material. We used two kinds, one that you apply with a brush, and another kind that is in sheet form. We decided to use it in sheet form with the adhesive, and stripe it on diag-





onally, and that has been there, and is there yet. It's washed with acid to clean it up. The plant runs for 24 hours, and that abrasive takes a beating like nothing else does. But we haven't yet had to replace one strip.

There hasn't been any slipping, and it seems to be just as abrasive today as it was when we applied it. And it still retains its original red color. We feel that red is more in line with a hazard than green for safety—it alerts the workers a little more.

We have also used this non-slip coating on walkways over the presses on our machines. It has been on a good three years, and as yet we haven't heard of any of the abrasive coming loose.

It is applicable around the wax machines and other places. If it does become coated the boys clean it, and they haven't been able to disturb it or knock down the adhesive qualities.

CHAIRMAN ADERHOLD: The next question is: "Who should give safety instructions to new employees?"

MR. MEINHARDT: Doesn't that depend upon the size of plant and operation, and whom you have available? We have plants with from 60 employees up to 6,000 employees. Certainly, the treatment of that subject in a plant with 60 employees wouldn't apply to a plant of 6,000.

In a plant of 60 or 70 the superintendent probably handles all safety functions and the hiring and firing. But in a plant of 600, he has assistants for that type of work. He has a personnel director, and he may have a full time safety supervisor. But no matter how big or how small the plant, in the final analysis, effective long-term instruction is that given continuously by foremen. Until the complete safety story is given a man by the foreman, all the rest of it is just so much window dressing. Safety has to get down to the level where the man is working. The little personal contacts we have heard so much about the last few days, the personal approach that Charley Dougherty talked about yesterday, and the personal approach that Rosenstein gave us in the *early morning sessions—these help* to do the really effective safety work.

MR. BIENVENU: In a few words, the fellow giving safety instructions ought to know the job and the hazards accompanying those jobs; and that requirement would apply to a large or small organization.

MR. HULTMAN: In our mill we have a card given by the personnel director, and all the main points of the section are on this card. The new worker has to sign this card, and every week the foreman gives a report to the superintendent.

MR. BIENVENU: Yes, but what we are talking about is a new man coming to work. Who is going to instruct him?

MR. H. G. KOKESCH [Mechanical Superintendent, Anglo-Canadian Pulp & Paper Mills, Quebec, P. Q., Canada]: We have a card that is given by the employment supervisor to every employee coming in. They are what you might call a resume of most all the accidents that might happen. The worker reads over this card, and if he is satisfied, and understands it, he signs it and turns it in to the foreman. If he doesn't, he is to question the foreman, and the foreman is to give instructions on all jobs on which he may be working.

We feel that the foreman is the key man. He knows the jobs that the man is going to work on, and knows all the hazards. He is in a better position than anyone else to give proper instructions.

MR. BIENVENU: Well, have you found it true in your organization that a foreman may go up to the operator of a machine and say, "Joe, here is a new man, he's going to be your helper. I want you to break him in on his duties and don't forget to go over the hazards of the job." Does that happen in your plant?

MR. KOKESCH: That happens in practically every case. If a helper he is to be given proper instruction by the first-class man. Practically all our foremen are first-class men with training in safety work.

MR. BIENVENU: Does the foreman at any time, in your setup, go back and check to see if these key points have been explained to the men?

MR. KOKESCH: Yes, that is done, in some cases weekly. In other cases where we have had minor injuries, he may do that every day. We teach safety before we start a man to work in the morning. We found out that so far this plan has worked out to our satisfaction and is the reason behind our safety record.

CHAIRMAN ADERHOLD: This next



question is a little different: "How do you control hand tools?" What is an effective way of keeping hand tools in condition?

MR. KEMP: When we find a defective tool, we bring it to the foreman, and it's his responsibility from there, whether it is a personal tool or company tool.

CHAIRMAN ADERHOLD: Who inspects tools?

MR. KEMP: The safety committee that makes the trips twice a month, does a lot of the inspecting, but the personnel director and the superintendents participate too. The foreman is our principal inspector because the problems always would get back to him. We have very little trouble with hand tools.

MR. BIENVENU: We have a different system that works very well in our plant. All tools are checked in to a central point. The man checking them in, or a toolkeeper, looks them over. Each operator, for instance, has a box of tools for his machine, and on the inside of the box is a list of the tools in the box. Tools are inspected when returned and if any of them look bad, they're taken out by the user and turned over to the maintenance department. Here there is a man who is responsible for all tools. He discards them or repairs them, as the case may be.

CHAIRMAN ADERHOLD: Here is another question: "Can waste paper bales be safely handled by one man and a two-wheel hand truck?"

MR. A. J. BASILE [Safety Director, The Lawrence Paper Co., Lawrence, Kans.]: Our bales run as high as 2,200 pounds, so we can't handle them on a hand truck. We used to take three men, but we handle them now with a fork truck, although we still do some hand trucking with smaller bales inside the buildings. Out in the yards, most of it is done with a fork truck. That is the only safe answer.

CHAIRMAN ADERHOLD: Here is another one: "Do you guard tops of lift trucks used for unloading and piling paper?"

MR. BASILE: We do.

MR. BIENVENU: We roof it over.

MR. BASILE: The roof is what we use on bales.

CHAIRMAN ADERHOLD: Do any of you use the other type which is just the upright back framework which extends up beyond the top of the bales? I'd like to find out how satisfactory that is. Do you use a roof, Mr. Kemp?

MR. KEMP: Yes, but we modified it, and are reconstructing all guards now. The guard we originally built was in line with the one recommended by the factory; it had flat bars across the top. We had a 1,000 lb. roll come down approximately eight feet, and although it didn't harm the guard in any way, we could see that stress was placed on the weld where the right angle was made to the vertical section. So now we have built that up to approximately 35 degrees and put a restraining bar through the center. We purposely dropped a 5,200 lb. roll on the part across the top to see what the safety factor was, and I hope that will do it now.

MR. BIENVENU: Do you use angles or channels?

MR. KEMP: We use pipe.

MR. BIENVENU: We have used channels on that and haven't had rolls as heavy as yours, but we've had large rolls fall and bow the channels, but we haven't had any injuries.

CHAIRMAN ADERHOLD: Do you have a drawing of that new guard?

MR. KEMP: If anybody wants a drawing of it, I'll be glad to give them what I have. It is ready to be printed. I'd like to ask a question: Have any of you developed a pushing block to be used between the tow motor and the roll of paper in the boxcar when the roll just slightly exceeds the width of the car—in order to close the door and safely load that car. We use a plank or two on the inside before we close the door. This is to give an extra bracer to the door. Sometimes you have to joggle those rolls around and put a lot of pressure on them to get them in. Has anybody here had that difficulty and developed a pushing block to use between the back of the tow motor and fit up against the roll to push the roll in while you slide the plank in?

This problem has resulted in one accident without injury in our operations.

CHAIRMAN ADERHOLD: Did a board slip?

MR. KEMP: That's right, it took a little skin off the fellow's ribs but it could have been worse. We haven't found anything satisfactory, although we constructed a sad-



dle like affair. The boys whittled the board down so it would conform to the concave shape of the paper. But we have tried so many different things, and we haven't found anything good yet. Has anybody here had that experience? What have you used?

MR. BIENVENU: We stretch the car.

MR. KEMP: Ours are stretched when we get through.

MR. BIENVENU: That does seem to be a problem. There would be no way of hinging a bumper on the back end of that tow motor that would be a permanent affair that you would drop down.

MR. KEMP: Well, we did make a gadget that would work on hinges, but the boys were getting hooked up, going around the back, and we discarded that idea. It was our first one and we didn't think it successful. If you could get that thing to recess into the side of the tow motor, it might be the answer.

MR. BIENVENU: Yes, it would prevent falling.

MR. MEINHARDT: From the standpoint of the poor fellows who have to unload these cars, don't do it, please. It's tough to unload a car filled to the gunwales.

MR. C. L. R. DOUGHERTY [Asst. Mgr., Industrial Relations, Union Bag & Paper Corp., Savannah, Ga.]: Do you have governors on the tow motors?

MR. KEMP: Yes.

MR. DOUGHERTY: How about telling us *something* about these governors? Our fellows say you can't control them.

MR. KEMP: I wish I had my garage foreman along with me, he might be able to give you the details. I know we have governors on two of our heaviest jobs, and they are no trouble.

CHAIRMAN ADERHOLD: Here is another question: "How do you select and train operators of plant trucks?"

MR. DOUGHERTY: We saw that picture in the *National Safety News* where the fellow had drawn on the floor how to run the truck. We take a new man, and then an old truck driver who has been trained by the training director, and they train the new man for a week before they turn him loose. We've cut down a lot of accidents that way. The details of just how the training is done is available by writing us. I wish I could give it to you, but it is not a proposition of just turning him over to an experienced man. You must train the man that is going to do the training.

MR. HARTWIG: I am curious to know whether anybody else here does any great amount of training off-the-job. I am thinking of the new employee in the box end of the industry who is put to work on, let's say, taking off sheets of stock.

Now, that's a fundamental operation that probably 90 per cent of the people in a box plant are going to have to do before they are through work. Even on the first day they're working there, they will have to do some of it. Does anybody here have an off-the-job training program as an introduction to work in the plant, and *if so*, how extensive?

MR. MEINHARDT: Well, we're contemplating it, and have for several years.

MR. DOUGHERTY: I just got through with that one. We worked that deal on machine girls in the bag factory. It is actually done in the work area, but the girl is not producing and she is in the hands of a trainer. We have a world of literature on it. We experimented with a training area, and we decided that wasn't so hot. The trouble is that you get the old broken down machines that didn't simulate actual production.

Our system is off-the-job training, although it is done in the work area.

CHAIRMAN ADERHOLD: You pay them for it too?

MR. DOUGHERTY: Yes, sure, you have to pay them.

MR. BIENVENU: We have something similar for the girls in our bag factory too. The biggest job is to get them to tie a knot.

MR. DOUGHERTY: That's right.

MR. BIENVENU: And it is tough to do that in a bag plant so we use a conference room. They spend the first day in there shuffling bags and tying this knot. It has cut down the training period tremendously, and, of course, the same thing could be worked in on safety.

CHAIRMAN ADERHOLD: I am kind of interested in what you do out in the Lakeview Mill, Mr. Homblette. Don't you have some sort of training program at Kimberly-Clark?

MR. A. J. HOMBLETTE [Safety Director, Kimberly-Clark Corp., Neenah, Wis.]: Yes, we do at Lakeview, and I'll tell you a little bit about the plant at Niagara Falls at the same time.

Parts of the various machines are duplicated in the training room. We use our regular J. I. T. Manual in which the job is broken down. We take beginners and teach them how to handle the wadding and break the wadding. We then move them into the converting department. There we have them watch and observe an experienced operator. Then we let the new man take over the machine, but the minute he gets behind, he steps out and lets the regular operator catch up. We have a duplicate of the converting equipment in the training room.

CHAIRMAN ADERHOLD: You have been working on job training for a long period of years?

MR. HOMBLETTE: Yes. And we find it really pays.

CHAIRMAN ADERHOLD: The next question is: "How do you prevent injuries handling cores and shafts?"

MR. BIENVENU: We have a stand on which to store the cores. We have our men wear safety shoes. They actually go through the operations before they ever take over the job. There is a technique to standing behind a core so as to keep it from falling on your toes. We have lift trucks to hoist the heavy rolls up. Some of those cores weigh around 300 lbs., so it takes two men to handle them. Where the two men aren't available, we have a lift, I think it's a Barrett, that is operated by a hand crank. You roll up this lift against the shaft, engage it, lower it and bring it to wherever you want. It's a mobile dolly.

MR. MEINHARDT: We have just completed some shaftless roll stands, which we hope will eliminate the hazard. We don't know whether or not that is going to be economically sound. Those things are expensive. It may assist the operation to the point where it really pays.

MR. BIENVENU: We have had one for five years. It works very well.

MR. WAYNE J. PARNIN [Safety Director, Fort Wayne Corrugated Paper Co., Hartford City, Ind.]: We have been using some shaftless roll stands, and we are going to use more of them in the Chicago plant. They found them satisfactory, although there has been some breakage on the worm drive on some of them. I have noticed that the breakage has been mostly where a new installation was put in, which may indicate that the trouble might be due to the need for operators to get used to it.

CHAIRMAN ADERHOLD: I'd like to go back to the previous question for a moment—injuries while handling shafts. Gus has some of the job instructions that are given to their men, and a few of them cover this particular hazard.

MR. BIENVENU: We mention under the hazards encountered by a counter corrugator man: "When handling shafts or rolls, lift with the legs and if load is too much, get help." At induction, the man is shown how to lift properly.

Some of the standard safety precautions are "Keep hands and feet in clear when handling shafts and rolls. Keep hands away from cores when shaft and rolls are in use on account set screw may slip. Do not wear loose clothing or long sleeves. If necessary to wear long sleeves, keep them buttoned."

Very often the shafts are warm on the friction end. We caution the man in handling shafts to take precaution on account of heat on the friction end.

CHAIRMAN ADERHOLD: We have another question: "What one feature do you feel has contributed most to your safety program during this past year?"

MR. KEMP: More stabilized employment.

CHAIRMAN ADERHOLD: I didn't expect that one. Is that a feature?

MR. MEINHARDT: That's part of it.

CHAIRMAN ADERHOLD: Does someone else have something that they think helped their program most in the past year?

MR. BASILE: I can tell you one that has helped; that was the safety slogan and match contest. It did the job for us in our mill. The fact is we brought them through four straight months without an accident, and we did, I think, eliminate one in our box mill during the period of the contest—about four months.

CHAIRMAN ADERHOLD: You distributed matches with safety slogans?

MR. BASILE: In combination with the money award. The matches, of course, went out first.





MR. HOMBLETTE: I think that putting the safety program in the hands of the hourly paid workers made our people safety-minded.

MR. MEINHARDT: My immediate superior, who is general production manager, labors, and rightfully so, I think, under the impression that accident prevention, waste control, quality control, increased efficiency of operation, all go hand in hand. The same factors that make for a good performance in one, make for a good performance in the other, and as Mr. Kemp pointed out, stabilized employment or stabilized personnel is the basis. With that down, the rest of them almost automatically come up. It is sometimes hard to tell whether your improvement in accident prevention is the result of anything you specifically did.

The frequency in our plants, generally, I believe has improved a little bit faster, certainly, than the National Safety Council's industry average. At the time we started really preaching the gospel of safety, our frequency was about double the national average. It is now running about 50 per cent better.

Tying quality and safety in one package and speaking about them as a unit appeals to many people. It reaches people, because the man who is running a plant and is primarily interested in quality, realizes that the same things he does to get quality will also get him better accident prevention.

CHAIRMAN ADERHOLD: One of the questions turned in is: "Do you have special fire precautions for storage of stock?"

I don't know just what kind of stock is meant. Let's take the storage of solvents. What precautions do you take in the storage of solvents?

MR. BRUCE J. BOERNER [Safety Director, Hummel & Downing, Milwaukee, Wis.]: We do printing. We use various solvents which some of the printing companies themselves recommend and which have flash points equal to or lower than kerosene. We have gotten away from gasoline entirely. We bring the solvent into the plant in five gallon containers. The inks are kept in an air-conditioned room which is sealed off. Any solvents in that particular department are also kept in the same room, but the storage of inks in each department which handles printing is centralized—there is a fireproof room for inks in each department. Solvents are kept in the same place.

MR. BIENVENU: How about cleaning printing dies? The insurance companies now ask that we build an asbestos-lined room in order to do that job.

CHAIRMAN ADERHOLD: Don't you have to clean them off sometimes during a run?

MR. BIENVENU: Yes, that's done with a kerosene or low flash-point solvent, but this other stuff which we use to clean printing plates is highly volatile.

CHAIRMAN ADERHOLD: Are you using a paste ink?

MR. BIENVENU: Ours is an oil base ink.

CHAIRMAN ADERHOLD: That's the hardest to clean off.

MR. KEMP: We have a special room. It's not fireproof, but soon will be made so.

CHAIRMAN ADERHOLD: For cleaning plates as they come off the presses?

MR. KEMP: Yes, and we have explosion proof lighting throughout the entire area. Everything done by heat is done by steam heat. Also we ground each machine individually, and we use Protectoseal on everything.

CHAIRMAN ADERHOLD: You get some of your inks in barrels. Do you use non-sparking tools?

MR. KEMP: Always, all the way through.

MR. DOUGHERTY: We had an explosion and fire in August, and we're working on this problem now.

MR. L. B. SCHLOEMER [Central Safety & Plant Protection Supervisor, Marathon Corp., Menasha, Wis.]: I don't see where there is any particular hazard in handling oil inks. Your inks are mixed with linseed oil and varnishes, and things of that nature. We have a major problem in one of our plants where we use high flash point inks, such as aniline inks, but I don't think there are many concerns here using aniline, are there?

There are some definitely established standards with regard to the storage and handling of flammable liquids. You can get those standards from the underwriters, and there isn't much deviation permitted where the question of storage is concerned. There are several general principles that you can apply in the handling of flammable solvents; one is that the quantity should be reduced to the minimum. Where that is not possible, it should be isolated, perhaps using underground storage facilities—that is, where you are getting into the hundreds of gallons.

Where it is not possible to isolate it, then, of course, you have to provide explosion-proof electrical equipment and ventilation.

One thing that is frequently forgotten in the handling of flammable liquids is the hazard of static electricity. There are enough conditions around a printing press to create static electricity, and we have had a number of fires within our plant resulting from it. Factory Mutual Insurance has put out an excellent pamphlet on that, "The Handling of Flammable Liquids." It is a complete booklet, and I am sure if you write to them for a copy they will be pleased to send you one.

The National Board of Fire Underwriters has something on it, but I don't think it is quite as good as what the Mutual has put out.

CHAIRMAN ADERHOLD: Mr. Kemp, you mentioned grounding barrels and containers. Have you had any fires caused by static electricity since you have done that?

MR. KEMP: Yes, we had a small one on a Number Three press. We think it was caused by static electricity.

MR. SCHLOEMER: I'd just like to add one very important thing.

I believe that in about 80 per cent of our accidents a person fits into the picture, and a large part of your fire risk, insofar as flammable liquids are concerned, can be largely controlled by establishing standard practices.

Next week in one of our plants we are starting an eight-hour course for every employee in one department handling flammable liquids. We are going to use the film, "The Chemistry of Fire." You can get it from a good many of the insurance companies or your vocational schools. In the first session, we will discuss the scope of the problem. In the second session we are going to cover in great detail the fire hazards, fire causes and fire prevention. In the next session we are going to cover fire extinguishers, and the next session organized fire control throughout the department.



It is important not to underestimate what your men can do. We would have had some very serious fires if it hadn't been for men specifically trained in the use of fire extinguishers. It could have involved an entire department because there were sufficient quantities of flammable liquids, and we could have had a burnout of maybe fifteen or twenty machines.

MR. KEMP: A year ago I made arrangements for the use of Protectoseal, and we went through with a visual education program with everyone in our plant who had to do with the handling of liquids of that nature. Later hourly paid employees came back and told us that if they had had to sit down and read that information, they wouldn't have got much out of it; but because we had discussion following the film they learned more.

CHAIRMAN ADERHOLD: That was a different topic than the one we started out on, but it's a very important one.

This particular question had to do with the storage of other types of things also. We have a large coal pile outside that's burning right now. Do any of you have that problem?

MR. KOKESCH: We used to have fires continuously in our coal piles all winter long, and we have an average of from 60 to 200,000 tons in the pile. As it was loose-stored, we got hold of a couple of bulldozers and ran over the pile and packed it down, and since then we haven't had one single fire, and that's eight years. It seems the more you pack it, the less danger there is of any air coming in and mixing with the gas and causing spontaneous combustion.

MR. ANTHONY O. VRANEK [Safety Director, Container Corporation of America, Chicago, Ill.]: We have about 30,000 tons, and we always had fires in our coal pile. We tried out that stunt, bulldozed it down to about 30 or 40 feet and haven't had a sign of fire so far, and the coal has been in piles about nine weeks.

MR. BOERNER: Our company has had quite a bit of trouble with wastepaper bale fires; I wonder if any of you store wastepaper in bales and what experiences you have had with fire.

MR. SCHLOEMER: I was an officer in the fire department at Cincinnati for 20 years, and the first big fire that I had was at the Container Corporation of America.



The fire was in an area 600 feet long and about 400 feet wide. Let me show you how fast this stuff will burn and how intense it can be in a relatively short period of time. There was a lot of traffic passing this particular area on a Sunday afternoon, and we, like many of you know, were out playing horseshoes. A lady who lived across the street was sitting on her front porch and saw it, and she came over and said, "Looks like there is a fire up at the Container Corporation."

The whole sky was full of smoke. We started dashing in the station to hop on the truck, and by that time the alarm started sounding off, and by the time the last gong hit, we were on our way. It was one mile away and we went 40 or 45 miles an hour, but when we got there, that entire area was on fire. There was one shed in there, about 200 feet long by about 125 feet in width. The columns on this building were 12'x12' and 14'x14', and the trusses were 10'x10' and 8'x8' with tie rods an inch and a half by an inch and a half, and when we got there that entire roof was down.

If you don't think that you have a possibility of a real severe fire in baled wastepaper, you're mistaken. We fought that fire until the following day.

Tying in with that there was a large amount of pulp in bales, and that stuff was almost as hard as Masonite. I had talked to the management prior to that, and they said, "Oh, that stuff will never burn."

You should have seen that stuff burn, if you think paper pulp won't burn, even though it is hard. In an intense fire you have no control over it.

CHAIRMAN ADERHOLD: How would you advise storing baled paper?

MR. SCHLOEMER: Well, first of all, you want to be sure you eliminate from the bulk of your storage paper which has a reasonable amount of lime, even if it is in bags, and things of that sort. I don't know how far down you go with your wastepaper, but some of it might have lime in it and nitrates and things like that. You know your chemicals, you can go down a list of chemicals and see which one of those things would act spontaneously with water.

The next thing to do is to break down your storage areas. It's good practice to have a minimum of 50 feet clearance between huge blocks. I'm speaking of a block that might be 200 feet long by 150 or 200 feet wide. I am only giving you my recollection of the figure; you can check with your insurance companies and they will give you accurate details.

The next thing to do is to be sure that you have reasonable water protection within the area.

Another precaution is to have your watchmen's tour stations cover that area. It often happens that they can catch a fire that is developing heat and smoke spontaneously.

CHAIRMAN ADERHOLD: Would it be a wise idea to have communications in that area?

MR. SCHLOEMER: Yes, if the area is, from one end of it to the other, anywhere over 300 feet, definitely.

CHAIRMAN ADERHOLD: How high would you store the baled wastepaper? That is, inside or outside.

MR. HOMBLETTE: Normally, not over twenty-five feet high.

MR. J. FRED BERRY [Alton Box Board Co., Alton, Ill.]: We pile it about the same height, 25 to 30 feet, not much greater than that, and we keep the piles separated by 50 or 75 feet. Our stalls go up a little higher than that, and we bale about a year's supply of straw all the time, and these bales go up about 40 feet high and about 200 feet long and about 35 or 40 feet across. If one of those gets on fire, all you can do is put water on it and keep it from burning too much and use it up as you go along.

CHAIRMAN ADERHOLD: Here is another question: "Do white lines make a big contribution to safety and to good clean aisles?"

MR. BIENVENU: There's a machine we use in our plant for marking the aisles, and it might be interesting to people not using it to know about it. It helps out a whole lot. It's the same machine that the street traffic department uses to mark crossings.

You can line your whole plant in a very short time, and if you keep the lines bright and new, you will run a greater chance of having people respect them.

CHAIRMAN ADERHOLD: How do you keep skid platforms flat and not on edge when empty?



MR. JAMES SULLIVAN [International Shoe Company, Chicago, Ill.]: The Container Corporation's Rock Island plant developed a skid that can be stood on end safely. It was a framework skid put together with angle irons and welded rod legs, and it had sufficient leg clearance so that you could stand it up on end. In actual tests, bumping the top of a skid standing on end, we pushed it across a highly resistant abrasive surfaced floor for a distance of some 20 feet without causing the thing to fall over.

The details on that were published in a sheet that went around throughout the entire corporation as a recommended type of skid to be used throughout the company. That was our answer to finding out how to keep skids flat.

I am sure if you wanted any information about this skid, you could get it by merely writing to the Container Corporation.

CHAIRMAN ADERHOLD: I can see where there is an advantage in having a skid that will stand up on edge without tipping easily because when a man is alone and tries to back up skids, he can easily strain his back. We've had two different methods of avoiding this hazard at our Menasha plant. In one method the foremen insisted that the workers stand the skids against a post because in that way they wouldn't form much of a tripping hazard because the upper legs kept you away from it, and they didn't tip over because the post was against the flat side. That worked fine in that department, but it didn't work in all departments because the foremen didn't insist on it.

MR. BIENVENU: We haven't been able to get them to do what you just mentioned. There is a hazard of somebody bumping into a skid and knocking it over, no matter how you stand it. So our rule is: skids are not to be put on edge. We carry it out quite successfully. Sometimes somebody tries to get by with something in a crowded area. For example: a man had a skid stacked on edge between a post and a load, and when it was brought to his attention he said, "It can't fall."

We had to call to his attention that somebody was going to move that load in a little while, and then it would be a hazard, but I think it is a matter of education. You must either keep plugging on it, or do what Mr. Sullivan said, get one as wide as it is long so it will stand up both ways.

CHAIRMAN ADERHOLD: I have a question of my own: We have a couple of bad drum winders. It is hard to convince the boys they could be reversed. I imagine somebody must have a nipguard of the type that rolls around the drum. Do you have one like that, Mr. Kemp?

MR. KEMP: Yes.

CHAIRMAN ADERHOLD: Could I bring our engineer down to look at that?

MR. KEMP: Yes.

CHAIRMAN ADERHOLD: Has anyone tried out or developed a usable guard for a trimmer? Apparently, the best answer up to now is controls such that the hands must be away from the knife to start the machine.

MR. BIENVENU: Two-hand controls.

MR. BOERNER: What do you do with a pin-type clutch on there where once the cycle is started it will complete. Your two-handed controls are effective only to start the operation. By the time that the knife is completing its stroke, the operator has plenty of time to get his hand in.

MR. VRANEK: I don't know how new our Seybold machine is, but we have one in which the stock is brought under the knife automatically after the initial setup. It works like a typewriter tab, and, of course, in our operation the cuts would be the same sizes. It's simply brought forward, and the man doesn't put his hands under the knife at all. And the knife has more of a shear action than the old drop blade.

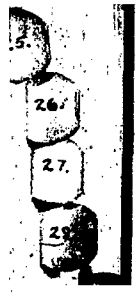
MR. BIENVENU: That's where you're cutting a constant size, isn't it, though?

MR. VRANEK: For the particular order, yes, you're cutting a constant size.

MR. BIENVENU: On some of them you may start off with a sheet 30 by 50 and end up with one, ten by ten, so that you have different combinations to make. That wouldn't work in that case, would it?

MR. VRANEK: No, it would have to be a standard size until you change to a different order.

MR. SCHLOEMER: Where would be the desirable position for the safety man within the plant organization, or his most efficient functions? Would it be directly under the plant manager, under the plant



superintendent, under plant engineering, or under personnel?

MR. MEINHARDT: Many books have probably been written on the value of functional organization charts, and there are varying opinions as to just how far you can go with a functional organization chart. It is a nice thing to start out with, but when you get through, you also have to fit personalities to it. So the question comes up, should you fit personality to the function or function to the personality.

There, again, I think that is something that is peculiar to each individual plant or organization. There are times when the safety department should be underneath the vice-president in charge of operations—as high as that, let's say. There are other places where safety should be under the production department. There are some organizations where safety probably is handled by a vice president. I don't know if any organizations are that big, but is that something you could put a hard and fast rule on?

Let's put the question the other way around. The answer depends upon the safety engineer himself. He can function most effectively and efficiently where he will fit himself in best.

MR. BIENVENU: I think that from my experience the best position is under production or directly under the superintendent. If a man is running the plant and is going to be responsible for quality and production and waste, and safety is tied up into every one of those, the safety man ought to be in that position just as the engineer or the foreman of the department is—directly answerable to the superintendent.

MR. KEMP: Consider first what safety is: it is a service department function. Now, where does top management want the service and how? How does he want the authority to give this service generated in the line organization. Now, that goes right back to what Meinhardt said. I think that has to be peculiar to your own particular plant because you have so many modifications, and your line organizations are different.

MR. SULLIVAN: I have always felt that one of the biggest faults of safety men, in general, is the fact that they are always going to people and asking them if they can do anything for them. That's this service concept. I think it's high time that a lot of us in safety begin to get the idea that somebody should come to us and say, "What can you do to help us?"

In other words, they should begin asking for safety. Now, that comes as a natural result of a simple analysis. Accidents, according to a lot of these books that I have read, can be really divided into two basic causes, either an unsafe act or an unsafe condition, either in combination or singly.

If management is responsible for the actions of their people and the conditions under which they work, that same management, in preventing accidents, should require the line organization to have definitely assigned responsibilities for accident prevention. If that is the case, then your safety man can be a service man because the line organization is going to come and ask him for help in preventing accidents in their own department; instead of the safety man being responsible for preventing accidents, the line organization is responsible and the safety man is merely an adviser, an assistant, a service man.



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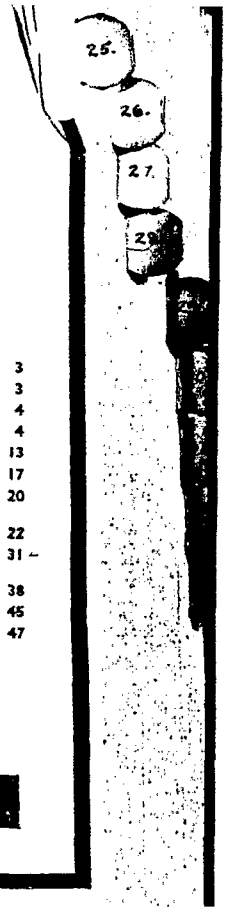
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# RAILROAD INDUSTRY

**As presented in the Sessions of the Railroad Section at the 1948 National Safety Congress**


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**Volume 25**
**Transactions**
**1948 National Safety Congress**



# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

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The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE RAILROAD SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Railroad Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Railroad Section carries on in behalf of its members, and for the benefit of accident prevention work in the railroad industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of railroads. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on pages 50 and 51 of this volume.



## Annual Report of General Chairman

By W. H. ROBERTS
Superintendent of Safety, Chicago & North Western Railway Co., Chicago, Ill.

It hardly seems possible that a year has elapsed since Charlie Bowling turned over the gavel to me as general chairman of this Section. Much has been accomplished during the year.

The program calls for an annual report from the general chairman, but the program committee has wisely confined the time for submission of the report to ten minutes. Several hours would hardly be sufficient to outline the progress and all the activities of the Section during the year. However, most of the activities of the Section will be outlined in the reports to be submitted by the various committee chairmen, and there is no need for an extensive report from the general chairman.

You have been provided with a copy of a brief history of the Railroad Section, which Les Dutton, our staff representative, kindly prepared for us. At the suggestion of Leonard Hoffman, we have also listed the names of the past general chairmen on the back of the history. It is interesting to see how many of these past general chairmen are still active in the Railroad Section. Laying down the gavel has not lessened their interest in safety and the Railroad Section.

As your general chairman, it has been my privilege to serve as a member of the Industrial and Traffic Conferences of the National Safety Council. The Industrial Conference held two meetings in New York and two in Chicago, all of which I attended. The Traffic Conference held three meetings in Chicago, all of which I also attended.

The President of the United States recently appointed a Conference on Industrial Safety. Messrs. Mumford, Naff, Long and Kimball and your general chairman were asked to serve on this conference. A preliminary meeting of the Conference was held in Washington several weeks ago. Representatives of labor, industry, insurance companies, safety councils and governmental agencies sat down and discussed ways and means to further reduce the number of industrial accidents. Another meeting of the Conference is scheduled for next March. I believe much good will emanate from the Conference.

The executive committee of the Railroad Section held three meetings in Chicago during the year—one in November, one in January and one in May. All were well attended and interest was shown by all those in attendance.

## Memorial to Herman A. Daake

It is with deep sorrow that we report the death of our friend and co-worker, Herman A. Daake who passed into Life Eternal since our last meeting.

His interest in safety was constant and deep. He had a warm heart and was quick and responsive in his personal contacts. His clear thinking coupled with his vast store of knowledge will be greatly missed by those he left behind.

Herman was an outstanding figure in the work of the Railroad Section. He served freely and unselfishly on a number of committees, as well as Secretary, Vice Chairman and Chairman of the Railroad Section. His unfailing devotion to the safety of the youth of the land will forever remain a memorial to a well-spent life; THEREFORE BE IT —

RESOLVED That the Railroad Section of the National Safety Council assembled in its annual Congress in the City of Chicago, October 19-21, 1948, record with sorrow the passing of our friend and brother and be it further —

RESOLVED That this resolution be recorded in the Minutes of this Congress and that a copy be sent to the family of the deceased.

*William H. Roberts*
*General Chairman*

*L. B. Harper*
*Secretary.*



# Greetings from Safety Section, A. A. R.

By J. R. TENNEY
Superintendent of Safety, Western Maryland Railway Company, Hagerstown, Md.
Chairman, Safety Section, Association of American Railroads

The most harmonious relations possible exist today between the Railroad Section of the National Safety Council and the Safety Section of the Association of American Railroads. Each one is especially well suited to accomplish certain things, and, in addition, there are many things which they can *do cooperatively*. Each one, then, is functioning effectively in its proper field, and both are working together for the advance of the cause of safety.

You might be interested to know that the prospects are bright for the employment of a staff safety engineer by the Safety Section. This will make the work of the Section more effective.

Another project in which the Safety Section is engaged is the revision of the code of safety rules gotten out by the Section in 1942 to bring them up to date, in the light of changing conditions.

Thus both our sections continue to move forward together, and it is a great pleasure to see the spirit of cooperation that exists between them. It is my hope that this spirit will always continue, and I am always ready to do everything in my power to make it continue.

# Reports of Standing Committee Chairmen

## Report of Secretary-News Letter Editor

By L. B. HARPER
Secretary-News Letter Editor, Railroad Section, N. S. C.,
Personnel Assistant, Illinois Central Railroad, Chicago, Ill.

The main function of my office is the editing of the monthly news letter of our Section. I am pleased to report that I was able to meet the deadlines reasonably well, and I leave it to you to pass on the merits of the material that went into the publication.

I want to thank all those who contributed to the news letter, and I ask you all to give all the help you can to the incoming editor.

I have enjoyed this work, even though at times it seemed like a good deal of a chore. If I can feel that I have made some contribution to safety in doing this job I will be well content.

## Report of Contest Committee

By C. L. LA FOUNTAINE
General Safety Supervisor, Great Northern Railway Co., St. Paul, Minn.

Awards were presented to the following winners in the Railroad Employees' National Safety Contest for the year 1947:

**STANDARD RAILROADS**

| *Group* | *Railroad* | *Operating Official Recipient* |
|---|---|---|
| A | Union Pacific Railroad Company | G. F. Ashby, president |
| B | Texas and New Orleans Railroad Company | E. A. Craft, executive vice-president |
| C | The Cincinnati, New Orleans & Texas Pacific Railway Company | J. T. Moon, general manager |
| D | New Orleans and Northeastern Railroad Company | J. T. Moon, general manager |
| E | Georgia Southern & Florida Railway Company | D. W. Brosnan, general manager |
| F | Lake Superior & Ishpeming Railroad Co. | A. Syverson, vice-president and general manager |



**The Pullman Company**

| | | |
|---|---|---|
| G | St. Louis Zone | H. A. Hudwalker, superintendent |
| H | Wilmington Shop | W. C. Dean, manager |

**Switching and Terminal Railroads**

| | | |
|---|---|---|
| A | The Cleveland Union Terminals Company | C. F. Wiegele, general manager |
| B | The River Terminal Railway Company | A. J. Gentholts, president |

The Green Book for the year 1947, published in May, 1948, marks the completion of a quarter century of this publication, and was captioned the "Silver Anniversary" edition, the cover being printed in silver ink.

The Green Book was from the very beginning uniquely the project of Lew R. Palmer who died in 1945. The twenty-fifth issue of this publication contains considerable history of the Green Book; also the "historic goals," as well as the prediction that if the railroads can continue to reduce their casualty rate approximately 10 per cent per year, as was accomplished during the years 1946 and 1947 as compared to the year 1945, it will carry the railroads to a rate of six casualties per million man hours by 1950, or, in other words, SIX BY FIFTY.

The chronological record of awards, as shown on pages 8 and 9, was of particular interest to me, as I am sure it was to the other safety officers.

The rules governing these contests are shown on the inside of the back cover of the Green Book. There have been no changes made in the contest rules during the past year.

## The Highway-Rail Intersection Program—1948

By C. M. KIMBALL
Chairman, Highway-Railroad Crossing Committee, Railroad Section, N.S.C.
As presented by GEORGE W. ELSTE
Superintendent of Safety, Baltimore and Ohio Railroad Co., Baltimore, Md.

Before going into this report, I want to pay tribute to the memory of Herman A. Deake, whose death occurred March 8, 1948. Mr. Deake was appointed chairman of this committee at the 1947 Congress and served until his passing. Certainly, none of us ever worked harder on the prevention of highway-rail crossing accidents than he did. I think it is fitting to remind you that, at the very last, he was carrying on his life's work. Death occurred at Cincinnati, you will recall, where he had gone to attend a regional meeting of the Safety Section, Association of American Railroads.

The "Signs of Life" program of the National Safety Council picked up speed during the past year. The year 1947 was largely devoted to the all-important preparation of materials and to their initial distribution. But, since the last Congress, these materials have been placed in the hands of state and local traffic safety organizations which, in turn, have passed them on to the driving public. The extent of this distribution is nothing short of amazing. It is demonstrated by the many requests for materials and information about the program which the Council receives daily from all over the country, including many out-of-the-way places. For instance, the girl who won the title of State 4-H Safety Champion in Arkansas worked the materials into her activities. School teachers by the dozens have written in. I mention these examples to show how the information is going down to the grass roots. The bigger programs will be discussed later.

In describing the 1948 program, let me remind you that "Signs of Life" is based on the philosophy that motorists will observe the protective devices and markings at highway-rail crossings if they are educated to, and sold on, the importance of heeding *all* highway signs, signals and pavement markings.

This means that all references I shall make to the "Signs of Life" include highway-rail intersection safety, because the



round advance sign, the crossbuck and the pavement markings are stressed in this material, along with the other devices.

In carrying on this program, we gratefully acknowledge the cooperation of other organizations in the same field. Among these is the Safety Section, Association of American Railroads which recently published an effective poster, and which also is vitally concerned with the reduction of highway-rail crossing and trespassing accidents.

Distribution of the yellow "Signs of Life" leaflet, with which you are familiar, has been aimed primarily at driver's license applicants because they are just starting their driving careers, and this is an ideal time to contact them with educational materials. State motor vehicle administrators and state police organizations are the channels through which this distribution is made. Another important distribution is through state and local safety councils and organizations, reaching the public at safety meetings, generally in connection with the showing of the sound slide film.

More than two million copies of the leaflet, and nearly 150 copies of the sound slide film have been put into use in all 48 states, either as an activity of the state officials or safety organization, or through their local counterparts. This does not include the more than 4,000 posters, 700 newspaper mats and other materials such as radio scripts, sample speeches, skeleton newspaper releases and the like which have gone out.

Neither does it include the 2,500,000 adaptations of the "Signs of Life" folder which were produced and distributed nationally by the B. F. Goodrich Rubber Company last June. This brings the total number of leaflets put into motorists' hands to nearly five million.

### Operation Safety

Although the Signs of Life program is a continuing, year-around activity, it received special emphasis during June when it was promoted as a part of the "Operation Safety" project of the National Safety Council and the Advertising Council.

In January, 1948, these two organizations inaugurated a plan of supplying state and local safety groups with kits of materials each month which provide a well-rounded special emphasis program designed for a seasonal hazard to highway travel.

In January, for example, the theme was Safe Winter Driving; during September, it reminded drivers that children were starting back to school. During June it was the Signs of Life.

The June project started with the preparation of a guide to show how the program could be carried on, and how the materials could be used effectively. Newspaper and radio materials were added, as was a poster, a mat, a sample speech, sample newspaper advertisement and other helps. These were combined into a kit which was distributed to 1,700 national, state and local traffic safety agencies. They also were sent to members of the Railroad Section.

Backing up this activity, on a national scale, were those press and radio releases which the National Safety Council distributed directly. Stressing the Signs of Life, radiograms were sent to every station in the country.

Outstanding in this connection was the support given by Eddie Cantor and Harry Von Zell of Hollywood. They voluntarily prepared six, five-minute radio transcriptions on the Signs of Life. These recordings were distributed only to radio stations which wrote in requesting them. The requests totalled just under 800, which set a new high mark in the acceptance of such recordings produced by the Council. Radio stations in all 48 states, Canada, Hawaii and Alaska broadcast these messages.

Time will permit only a few examples of how the June Operation Safety project was carried out by local organizations. In Los Angeles, the Women's Division of the Chamber of Commerce, cooperating with the Greater Los Angeles Chapter, National Safety Council, sponsored the month's program. They put the Signs of Life, on the radio, into the newspapers, made it the subject of speeches at safety meetings and generally utilized all channels in reaching the public. They even prepared their own series of newspaper mats to supplement those received with the kit.

In Kenosha, Wisconsin, the newly organized safety council was launched by carrying on the Signs of Life program during the month.

A few of the other cities in which the operation was noteworthy are: Buffalo; Rochester; Baton Rouge; Cleveland; Pasadena; Oakland; Oak Ridge, Tennessee; Springfield, Massachusetts; Seattle; Columbia, South Carolina; Jacksonville; Kansas City; Milwaukee; St. Joseph, Missouri; and Topeka.



### Other Activities

The Signs of Life idea also reached the public through other channels during the year. The leaflet went out to farmers in connection with National Farm Safety Week in July. Trucking fleets have used it as a part of their driver safety programs. The illustrations and text have been reproduced in dozens of employee magazines of railroads and other industries. National advertisers have included the idea in prominent publications. It is widely used in connection with school driver training courses. A Michigan newspaper published an article chiding local officials for not being more active in teaching drivers the importance of traffic control devices.

In Spokane, the Signs of Life materials were the solution agreed upon by an emergency meeting of county and local officials and representatives of the Spokane Area Chapter, National Safety Council, to meet an unexplained upsurge in highway accidents.

Summing up these examples, it becomes obvious that both cannon and scatter shot are having their effect. Add these major programs, just described, to the cases I mentioned early in the report, and you get some idea of the coverage this program is achieving.

### Trespassing

I do not want to encroach upon the report of the Trespassing Committee, but do want to point out that the National Safety Council has, along with the Signs of Life, begun to produce materials to discourage this hazardous practice. The reason for mentioning trespassing will be brought out in the description of our newest project, which follows.

### Speech Materials for Railroad Men

Traffic safety agencies are making good use of the Signs of Life materials, as I have attempted to describe. We have felt for some time, however, that additional factual data could be developed and placed in the hands of railroad safety officers so that they, and their representatives, could cooperate in this all-important attack on highway-rail accidents through their own activities.

Within the near future, you will receive a kit very much similar to the one produced for "Operation Safety" but designed for your own purposes. It will include a program guide which will offer suggestions for the utilization of railroad personnel who make safety talks. It also will show how they can work along with the traffic people in this activity. Further, it will list the many materials, such as posters, and other publications, which you can use in your program. Finally, it will list the principal organizations active in highway safety. Because this will be given you at that time, I shall not go into detail here.

The folder will serve both as a cover and as a file for these and additional materials which will be supplied. These include sample speeches, covering both highway-rail intersection accidents and trespassing. You already have received the first of these outline speeches designed for presentation to school children. Later outlines will be suitable for talks to older school children, service clubs, farm organizations, women's groups, your own employees, and similar gatherings.

We consider this project to be one of the most important undertakings of the year, because the railroads have a vital interest in the Signs of Life program, and heretofore they have not had materials developed especially for their own needs. This will fill that gap.

In addition to using the speaking materials which will be furnished, there are other things the railroads can do to contribute to grade crossing safety. You will find them listed by John R. Tenney, then Chairman of the Committee on Prevention of Highway Crossing Accidents, Safety Section, A.A.R., in his 1947 report, and also incorporated by reference in his report for 1948. I shall not detail them here. They include such matters as putting and keeping crossing surfaces in good shape, keeping obstructions to view cleared away, and other important matters. They are particularly important as evidence to the public of our good faith in supporting this program. We are teaching the public to respect highway-rail intersections. Let us not lose that re-



spect by permitting annoying and dangerous conditions to exist at our crossings.

### Other Future Plans

At the beginning of this report I said that we are rolling on the "Signs of Life." We intend to keep rolling. Safety, as you all well know, is not the result of a magic formula, but the continuous pounding at fundamentals. The railroad safety men's kit I have just described is one segment of the job. We plan to keep on telling the public, at every *opportunity*, that the individual has a responsibility for safety at highway-rail crossings. We shall continue making Signs of Life materials available to traffic safety organizations everywhere. We shall prepare a new set of materials for the Operation Safety project next June. The National Safety Council will continue to support this work through direct press and radio outlets. We shall continue to cooperate with the other organizations working along these same lines.

### What Are the Results?

The final point, of course, is an attempt to summarize the results of all these activities. This is difficult. We know that the *number* of highway-rail intersection accidents is lower this year, but I hasten to say that we do not want to assume too much credit, because we have not had an opportunity to analyze the figures. On the other hand, it seems to me that no one can deny that this continuing emphasis, throughout the entire nation, has some share in producing the desired results.

## Report of Trespassing Committee

By J. R. TENNEY
**Chairman, Trespassing Committee, Railroad Section, N.S.C.; Superintendent of Safety, Western Maryland Railway Company, Hagerstown, Md.**

Much of the work of the Trespassing Committee has already been covered in the report of the Highway-Railroad Crossing Committee, since the two programs are so closely related.

I do want to mention, however, that the "comic book" leaflet intended for school children has received very wide distribution, some half a million copies having been placed in the hands of children. A number of schools and teachers have voluntarily asked for copies, which have, in most cases, been furnished by railroad companies.

At the present time we lack adequate statistics on the subject of *trespassing*, and these will have to be secured before our efforts can be directed with *full effect*. Steps are under way to try to remedy this deficiency.

## Report of Membership Committee

By J. R. THEXTON
**Chairman, Membership Committee, Railroad Section, N. S. C.; Superintendent of Safety, The Delaware, Lackawanna & Western Railroad Company, Hoboken, N. J.**

I am happy to report that just before I left to come to this Congress I had the assurance that the Lehigh Valley Railroad Company was sending in a membership application. This company dropped its membership a couple of years ago.

This leaves, now, only one railroad of over 800 miles length in the United States which is not a member of the National Safety Council. A year ago there were six large railroads which were not members, and now five of them have come in.

The railroads are very faithful to the Council; seldom do they drop out. This is particularly true of the larger roads. Occasionally a small road drops membership, but only rarely. But small or large, we hate to lose them.

There are two projects before the membership committee: to get the membership of that one remaining railroad, and to go to work on the short lines. There are over 300 short line roads in this country, and it is proposed to find means to approach them through the American Short Line Railroad Association.

Never has the Section been in such a commanding position so far as mileage represented is concerned. But we cannot let up on our efforts so long as there is one railroad which is not a member.



## Report of Visual Education Committee

**(Summary of Remarks)**

By A. A. LOWE
**Superintendent of Safety, Southern Pacific Co., San Francisco, Calif.**

Your Visual Education Committee has had an interesting exchange of correspondence and verbal discussions with many of the members during the past year.

Vice-chairmen Greenfield, Chaney and Davis have worked with members of their sub-committees to develop ideas, and trends and to formulate recommendations for future guidance of all concerned in this very important field. We circularized many roads for information as to films, recordings, etc., produced by them. This information has been tabulated and passed around. The responses indicated that only a small beginning has been made in preparation of visual education material with specific reference to railroad activities.

There are many films available through insurance companies as well as from the National Safety Council which deal with safety in general both as respects accidents and health, but there are all too few productions available which can be used to good advantage on any and all railroads. I would suggest that as more are made we keep in mind the general idea that insofar as practicable we avoid features which may not be applicable to all roads so that when they are shown by others who may purchase copies they will not have to apologize for, or explain any of the pictures or the script which might otherwise be in conflict with their rules or practices. I do not think this will be an insurmountable task because as a rule nearly any portrayal of an accident or hazard can be tied to standard rules.

My vice-chairmen have done very well, indeed, in getting a considerable amount of material before you in the brief time allotted to them. I shall not attempt to elaborate upon what they have said, but I wish to add a few words with respect to my general observations and experience. First of all, I am thoroughly satisfied and convinced that the employees I am associated with almost to a man have come to a full realization of the fact that prevention of accidents is a very personal matter with them and that it means more to them as individuals than to the company or to anyone else in the whole world unless it be those dependent upon them. Also I find the employees are eager to be taught how to avoid injury and lastly that by far the most effective means of teaching them is with audio-visual equipment of various sorts.

Mr. Greenfield very aptly remarked that each kind of equipment has its place.

In addition to the usual three types I would like to recommend to you the wire recorder machines for extensive use. We have gone in for them in a big way. I have one on my desk and when an accident occurs I can quickly put a description of it on the wire or if some thought occurs to me that I wish to broadcast I can record it on as many spools as necessary and send one to each of my supervisors on the line who may have one of the machines, and he can reproduce the message to as many groups of men as he wishes. We are having our general and division officers prepare talks and put them on the wire for reproduction for the benefit of the men to whom addressed. We reach staff meetings, small section meetings or groups of 100 to 500 in this manner. The possibilities are quite unlimited. I trust the members of the committee for the ensuing year will carry on from where we leave off and greatly enlarge upon the start we have made this year.

### Report of Films Sub-committee

ROBIN I. GREENFIELD [Supervisor, Canadian Pacific Railway Co., Montreal, Que., Canada]: During the late war, industry found that by skillful use of pictures on film it could teach to green hands in a matter of weeks highly skilled trades which used to take years of training and job experience to master. "One picture is worth ten thousand words," is a time-honored generalization which may or may not, be entirely accurate, but there can no longer be any doubt that teaching can be done more effectively with the aid of pictures than by words alone.

Your sub-committee is charged with developing recommendations as to the use of films in railroad safety education work. Much correspondence has been exchanged, and a great deal of discussion and argument



has taken place. We have arrived at the *conclusion* that "skillful use of pictures" involves a surprising number of factors, for while quality of script and photography, planning and execution are foregone conclusions, the type of film aid to be used must be given careful consideration. As the education experts admit, no one type of teaching film—motion picture, slidefilm or slide—is the final word among audio-visual aids for instruction purposes; each type has its advantages and disadvantages. Furthermore, it is obvious that good films are wasted unless the manner of presentation is right and adequate distribution control ensures that appropriate subjects are in the right place before the right audience at the right time.

No three-man committee alone can solve so many problems. And so we have drafted a questionnaire which has been distributed to each member railroad of the Section.

When the replies are all in, and tabulated, we think we will be in a position to make recommendations regarding the use of films in railroad safety work, and it is our intention at that time, if all goes well, to publish a brief for the information of all concerned.

### Report of Safetygraph Sub-committee

J. A. CLANCY [Supervisor of Safety, The New York, New Haven & Hartford Railroad Co., New Haven, Conn.]:

(Mr. Clancy gave a demonstration of a safetygraph and a detailed exposition of the use of these visual aids. He mentioned the possibility of producing one or more safetygraphs at some future date for the Railroad Section.)

### Report of Posters Sub-committee

A. E. DAVIS [Superintendent, Department of Safety, Chicago, Burlington, & Quincy Railroad Co., Chicago, Ill]: Safety posters have a definite place in any well organized accident prevention program, but to be effective they must be appropriate to the theme, interesting and understandable in much the same manner as in any other selling program. Unfortunately, some posters do not measure up to this. All too often they fail to attract attention, or they fail to leave a favorable impression on the reader, principally because they are either pointless or portray a ridiculous situation.

To illustrate this, some time ago a photo-poster was offered for sale to Railroad Safety officers showing the breadwinner leaving home for work carrying his lantern and dinner pail. On the front porch stood his good wife, a small boy about six years old, a young lady 16 to 18 years of age and a young man about six feet tall (presumably his son or son-in-law), who should have been going to work too. The most disgusting thing about the scene was the blank look on their faces as they waved good-by to the old man in a halfhearted manner. How much more impressive it would have been had the poster portrayed the mother with a baby in her arms and one or two little tots by her side, holding to her apron strings as she waved and said, "Good-by daddy, be careful today."

One thing that has been quite noticeable of late is the growing tendency of some artists to try to put over safety messages with comic posters, even to the point of sometimes ridiculing workmen or poking fun at them. Undoubtedly, this is resented by many of the men and, in my opinion, does more harm than good. Safety is a serious matter and not something to be joked about or laughed at. If in doubt about this, ask some unfortunate fellow with an empty sleeve or pants leg; or some one who has helped to remove the lifeless body of a fellow workman from the scene of an accident; or one who has had the unpleasant duty of notifying the wife or mother of a fellow employee of his untimely death.

I do not want to leave the impression with you that I think all posters should be morbidly serious and cause cold chills to run up and down your spine. Such is not the case. Safety is a means to life and happiness, not to death and sorrow and can be portrayed as such through the use of posters both humorous and serious. However, there is a difference between good wholesome humor and ridicule. Clever indeed is the artist who can put this point across.

Then, too, to be effective, posters should be displayed in an attractive manner, like dress goods and other materials in shop windows. A well-kept bulletin board with posters and other reading material neatly arranged creates interest in safety, whereas one permitted to become cluttered with torn, dusty material makes little if any impression.



## Report of the Committee on Statistics

By T. H. CARROW

Superintendent of Safety, The Pennsylvania Railroad Co., Philadelphia, Pa.

During the first six months of 1948, 6,126 train accidents were reported vs. 6,348 in the same period of the previous year, indicating a slight reduction.

Out of the total number of train accidents 339 resulted in injuries vs. 438 in the same period of the previous year, showing a substantial reduction under this head.

Fatal injuries to all classes of persons, except trespassers, in train accidents dropped from 195 to 126, a reduction of 35 per cent. Non-fatal injuries dropped from 1,502 to 1,238, a reduction of 18 per cent. The figures, as they stand, indicate the possibility of substantial further improvement in the train accident record.

Fatal injuries to all classes of persons in train-service accidents dropped from 1,136 to 938, or 17 per cent. Non-fatal injuries in train-service accidents dropped from 12,435 to 11,462, or 8 per cent. Any improvement is in the *right* direction, but the figures clearly indicate the possibility of further improvement under this head.

Fatal injuries in non-train accidents dropped from 119 in the first six months of 1947 to 76, or 36 per cent. Non-fatal injuries dropped from 9,844 to 8,691, or 12 per cent. Fatal injuries in non-train accidents show an excellent improvement and while the reduction in non-fatal injuries under this head is substantial, it is obviously possible to make much further improvement.

The total of all fatal injuries to all classes of persons, except trespassers, dropped 21 per cent, indicating substantial progress. Non-fatal injuries dropped 10 per cent, which also indicates progress, but not to the extent that should be expected in the coming year.

Referring to employes alone, the killed rate dropped from .198 in the prewar year of 1940 to .171 in 1948, or 14 per cent. The non-fatal injury rate rose from 6.98 in 1940 to 8.80 in 1948, an increase of 26 per cent. It is possible that the increase in non-fatal injuries is due in some measure to injured persons remaining off duty on account of injuries for which they did not remain off duty in the pre-war period. In any event, the employee non-fatal rate of 8.80 for 1948 is unnecessarily high and can be reduced.

The table shows accidents under general causes. With respect to train accidents, it is impressive to notice that there was a reduction in the number under "Negligence of Employees," while the number under "Defects in or Failure of Equipment" shows a slight increase and under "Defects in Way or Structures" only a very slight decrease.

It is reasonable to conclude that the showing with respect to defects or improper maintenance is attributable almost entirely to the inability of the railroads to make sufficient money to provide all the labor and material necessary. This harks back to the war, when the railroads made sufficient money but were unable to secure material, equipment and labor and therefore had to pay out in taxes a large part of the money that should have been devoted to new equipment, material and maintenance. In other words, the railroads were not permitted to set aside the money that should have been devoted to this purpose. When labor and material became available they didn't have the money.

As the number of casualties shows very little change, the number distributed among the respective causes, as a rule, also shows very little change. It is worthy of mention, however, that both fatal and non-fatal injuries show a slight increase under "Coupling or Uncoupling Cars," a cause of accidents that can be warded against only by compliance with the rules.

Under "Contact with Fixed Structures" a large increase in fatal injuries is shown, although the absolute number is small. "Getting on and off Cars" shows a slight increase in the number of employees killed, but a very slight reduction in injuries. This cause accounts for nearly one-quarter of all injuries and such accidents are preventable by improved housekeeping and increased care on the part of persons getting on and off.

A substantial reduction in employees killed is shown under "Miscellaneous causes," which includes falling off cars or



trains. There is also a good reduction under non-fatal injuries under this head, which includes sudden stopping, starting, lurch or jerk of train. There is some indication here that train handling is improving.

### Conclusion

The conclusion to be drawn from these figures and the causes is that the trend of accidents is definitely downward. But it is worthy of mention that improvement in the record is not only due to an improvement in training, supervision and discipline, but is also due to what would naturally be expected from the development of a more stable working force. The record as it stands constitutes a challenge to the railroads to further improve their respective performances along safety lines. If the railroads are enabled to earn sufficient revenue to provide the material, labor and equipment to properly maintain the property and if training and supervision are somewhat intensified wherever needed, further reduction in train accidents, as well as injuries to employees and all other classes of persons, will result.

## Report of Safety Devices Committee

By D. W. NAFF
Superintendent Safety, Norfolk and Western Railway

Your Committee on Safety Devices respectfully submits herewith its report for 1947-48. Since the annual meeting of the Railroad Section, in October, 1947, at which time the Committee on Safety Devices was established, the following detail sheets have been prepared in draft form:

Detail Sheet No. 54, "Interior Arrangement of Section Tool House"

Detail Sheet No. 55, "Air Hose Coupling Hooks"

Detail Sheet No. 60, "Hand Truck Attachment for Handling Dock Plates"

Detail Sheet No. 66, "Safety Chain for Locomotive Wheels"

Two of these detail sheets, Nos. 54 and 60, met with favorable reception and have been sent out to the members of the Railroad Section. Detail sheets Nos. 55 and 66 have not been issued in final form for distribution to the members, as agreement upon some of the features involved has not been reached. However, it is hoped that these two detail sheets may be ready for distribution within the near future.

Mr. L. W. Dutton, staff representative, Railroad Section, advises that he has on hand a considerable stock of drawings, photographs, and sketches of various safety devices suitable for production as detail sheets, to be sent to the members during the coming year. Your committee feels safe in saying that a program has been started which should be of considerable benefit to the members of the Railroad Section in the future. The question of whether or not the activities of your Safety Devices Committee will be of real value largely depends upon the cooperation of the members of the Railroad Section in submitting photographs, drawings, sketches and the like, of safety devices and appliances which have proven practical on their respective premises or elsewhere, and we solicit your continued support in this matter. Such material as may be submitted should be sent direct to Mr. Dutton, who prepares the detail sheets for submission to the Safety Devices Committee and others concerned for their comments and approval, and who later issues such sheets in final form and distributes them to the members. Mr. Dutton has been largely responsible for organizing the work of the Committee on Safety Devices, preparing the sheets and attending to other details, and your committee wishes to express its appreciation to Mr. Dutton for his valuable assistance.

It is only natural to assume that all of the members of the Railroad Section who receive these detail sheets in final form will not agree with all of the features in all of the reports, but it should be remembered that there is nothing mandatory about these detail sheets. They are distributed as information and for such use as the members may care to make of them. However, helpful suggestions and criticism from the members will be very welcome and will be of valuable assistance in guiding the activities of the Safety Devices Committee in the preparation of future detail sheets.



## Report of Safety Instruction Card Committee

By C. M. BOWLING
Chairman, Safety Instruction Card Committee, Railroad Section, N. S. C.; Superintendent of Safety, Louisville & Nashville Railroad, Louisville, Ky.

During the year our committee produced one safety instruction card, No. 619, on *Power Adzing Machines—Operation.* More cards are in process.

Safety instruction cards, which are 3" x 5" in size, are designed for direct distribution to employees. They sell in quantity at a nominal cost. It has been felt that these cards offer to the railroad safety people a very satisfactory means of getting specific safety instructional material into the hands of workers, and that it would be worth our while to exploit this educational aid more fully than has been done in the past. Our committee, therefore, was appointed with the idea of making a beginning in this direction, and the beginning has been made. There is nothing to prevent next year's committee from producing a considerable number of safety instruction cards, to the benefit of all members of the Section.

## The Interest of Railway Management in Safety

By J. W. BARRIGER
President, Chicago, Indianapolis & Louisville Railway Co., Chicago.

Railroads strive to become safer not only to conserve life and limb, but because such progress is an integral part of advancing standards of development and of maintenance of properties and equipment and of training, supervision and discipline of their organizations. These operating factors are the essential prerequisites of technical efficiency, commercial success and earning power. Safety then appears as the end product of good management, and it takes on a new and enlarged significance in this honored role.

Railroad officers are recognizing this inherent characteristic of safety more generally. Their clear realization of it will lend impetus to their future efforts to make the railroads safer; both because of the growing importance of safety as a goal within itself and because a good safety record is proof of good operation. Safe operations emphasize and underscore good management and vice versa.

The work of indoctrinating an organization with high safety standards can no longer be regarded with doubts that it may impose interruptions to or interferences with normal operations. Instead safety will take its rightful place among the basic policies which are continuously being utilized to build superior physical standards into property and equipment, progressive technical methods into planning and a high order of personal skill and experience and training into the organization. Those plans and procedures which facilitate production of better service at lower costs prove to be the most fertile ground in which principles of safety will flourish and the latter will also nourish those other developments. This produces a natural "community of interest" between safety and good management.

It is then clearly apparent that safety is not something apart from good management; it is one of the basic ingredients of it. In fact, safety is such an important component of executive direction, responsibilities and opportunity that this feature of administration cannot be delegated to anyone. Good safety standards and practices are like good manners; one must develop them for himself. He cannot hire someone else to make up for his own deficiencies and ignorance. This is equally applicable throughout the entire organizational range from president to unskilled labor. Standards of safety, like those of public relations, must be matters of general indoctrination with the leadership coming from the top.

It is important to emphasize the primary



relationship of safety to good management because there may still be some who harbor lurking suspicions that high standards of safety are in reality a luxury which can only be afforded by a relatively few fortunately situated companies that have attained exceptional standards of development and unusually favorable conditions of earning power; sometimes a legacy from the past. Safety and earning power and property development are all closely related since each is the child of the same parent—superior management. A present railroad management may have been "born with safety"; if not, it must acquire the characteristics of safety because those cannot be imposed from without.

Safety is a many sided question on the railways. One instinctively thinks of it from the standpoint of the human equation and considers accidents largely due to the "failure of the human element." However, it is obvious that hazards also lurk in every one of the millions of component parts of a railroad's plant and its equipment which are subjected to the intense stresses and strains of moving traffic. They also can arise from functional faults occurring in the myriad features of the apparatus used to control and direct trains.

Every inch of railway track and the roadbed on which it lies, every structural member of a bridge, every switch, every part of every car and locomotive, every component of the facilities used in train movement and many other types of railroad property are subject to breakage or derangements which can invite disaster to train movement. Likewise, every movement and action of hundreds of thousands of employees, if improperly or carelessly or inattentively performed, can directly produce or unloose a chain of sequences leading to an accident.

In the face of these potential hazards, it can be truly said that the relatively low accident rate on American railways is a great credit to their managements and to their employees. The relative infrequency of failures and accidents attests the excellence of design, manufacture, installation and maintenance of the physical parts of the railroad. Moreover, the competence, training, discipline and loyalty of the railway employees keep "man failures" low in number.

While statistically there is much in tabulations of safety data to afford encouragement and satisfaction, on the other side of the coin, all must be aware of the huge toll of blood and treasure which railway accidents consume each year. This great waste and the human tragedies accompanying it, must be held down to the minimum levels which we have the ingenuity and energy to attain. Until then, we must neither confuse progress with achievement nor let any pleasant delusion of the latter type dull our zeal to go forward.

From the outset of railway history all improvement in standards of service and efficiency has been gained by moving trains of greater carrying capacity at higher speeds. That remains the only avenue of progress and the spur of competitive necessity will accelerate the rate at which the railways will proceed along this course into the future.

Railway development has always been held in excellent balance and coordination to permit all of the component factors of construction, operation and maintenance to move forward simultaneously to accommodate whatever were the standards of train service of the time. No matter whether the subject under specific analysis is locomotives or cars or rails, bridges, signals, terminals, communications or shop facilities, or any other feature of rail transportation, the advances in each field has permitted all others to move forward unhindered. This progress has enabled railway management at all times to utilize the full potential of the then existing state of development of the locomotive.

Such a variety of industrial and commercial activities are involved in railway operation that questions of safety must be viewed from many aspects. It is commonly associated only with freedom from train service accidents, but the vast extent of the railway's work on its track and equipment maintenance produces problems of accident prevention in those activities which have more of the technical characteristics of industrial, or factory work, than that of transportation. Freight stations and even offices also present their peculiar occupational risks, albeit of lesser hazard than the other places of working on the railroad. There is no kind of an accident that can happen anywhere which cannot occur on a railroad, so its campaign for winning the battle of safety must be planned on that broad scale.



The greatest number of casualties resulting from railway operations are not ones of its own making but are superimposed upon it by the phenominal growth of motor transport in America and the very large number of highway grade crossings. The frequent collisions between trains and automotive vehicles at highway crossings are wholly unnecessary, because every one of these could have been prevented by the driver of the wrecked car using ordinary prudence and care before crossing the track. Unfortunately the mounting toll of accidents of this nature constitute a national tragedy comparable only to the losses of wars. Safety at highway grade crossings lie largely within the willingness of automobile drivers to "Stop—Look and Listen." It is unfortunate that in this paramount feature of railway accident prevention, railway management is without any direct controls over the persons it is trying to protect. The active support of the police powers of the State are required to curb this futile death toll.

Avoidance of accidents is primarily a responsibility of management, but it is one which requires the closest cooperation of those who are the potential victims of these sad occurrences and of their families, too. Accident prevention should begin with excellence of design and adequacy of construction standards to be certain that every feature of the plant and equipment and auxiliary facilities have the strength and capacity for the work required of them and do not expose the operator to any avoidable risks beyond those minimum ones inherent in any moving machine. Good maintenance is closely related to these primary considerations in order that initial qualities of safety which have been built into a plant or machine or unit of equipment will remain unimpaired by use and age.

Next in sequence in observing safety is the training of employees in the skills necessary for proper conduct of their work. This is probably the most important single feature of railway training and supervision and is a subject of immensely broad dimension and detail. It must include indoctrination of all basic safety principles and stress the avoidance of unnecessary exposure to risk and the unintentional creation of conditions which increase the probability of accidents. It is significant to observe that the favorable working conditions and training necessary for efficient performance of work from the basic production standpoints of output and economy are the very same ones which will automatically produce safe operation.

Even the best of equipment and machines and facilities are neither foolproof nor automatically and completely safe in their functioning. They must be run and tended and maintained by men, and the men as well as the machines must be safe at all times.

Man's primary safety appliances are his five senses and the intelligence with which he has been endowed by nature. To these must be added the experience and understanding gained from one's own work and observations. The speed of rail transportation long ago made the physical limitations of the range of human vision and hearing and speech inadequate for the protection and control of train movement. The standard code of train rules and systems of signals, interlocking and communication were developed over the years to insure the continuously safe movement of high speed trains by crews which were informed of essential information about track conditions ahead by those means which safely overcame the handicaps of not being possible to stop within the range of physical vision or hearing. The technique of train movement and signal protection in effect extended the train crew's vision far beyond its ability to see ahead with their own eyes.

Train orders, timetables and signals give the crew of each train substantially all of the information it now needs to know about conditions ahead on the track over which it will run: However, with the increasing speeds and train lengths that can be expected in near future years, it may be necessary to keep train and engine crews informed of other operating conditions which cannot always be transmitted by these present agencies for controlling train movement. Radar, television and radio phone communication hold vast possibilities of expediting trains and making their operation safer. It is indeed possible to visualize most train accidents, other than those directly resulting from track and equipment defects, as ones which should be preventable by the further development and general railway utilization of devices of this character.

An observant traveller on the American



railways today will clearly see the physical foundation of the fine safety record of the American railways. These will reassure him of the probabilities of his own present and all future trips ending safely. However, there are some few operating conditions which he will recognize as distinct liabilities to safe operation.

Too many of the freight cars running on the American railways today are nothing more than railway jaloppies and while suitable for movement in short trains running at low speeds, constitute a hazard to high speed movement of heavy trains, especially when these inadequate vehicles happen to be placed among the cars at the head end where stresses and strains are most severe.

Any freight car that can be offered in interchange can be loaded to any destination accessible by rail in all of North America. It follows that any interchangeable freight car may move on any railway and behind any locomotive on this continent. Passenger cars and locomotives are specifically assigned to the service for which suitable and the older units are not used for the more exacting work. However, with freight cars it is "all or none" and with the necessary flexibility of freight movement, which is the essence of the perfect coordination of American railway service, there can be no regulation or restriction of car movement so long as the units of equipment meet the minimum interchange requirements.

These must be raised for freight cars. We must now forsee the necessity of soon voluntarily prohibiting the use of any freight car for interline loading which cannot safely be placed at the head end of the longest and heaviest and fastest freight train that runs anywhere in America. The way to get jaloppies off the railway is to have a low differential per diem or mileage rate for equipment of advanced age or of such general design as makes it obsolete or inadequate for modern freight transportation. Jaloppies penalize railway freight operation; accelerated retirement of such cars should be forced by sub-standard per diem or mileage rates for these sub-standard cars.

With the fortunately heavy current loading requirements for freight cars occurring while the construction of new cars barely touches the 10,000 unit monthly goals of production, this problem of the railway jaloppy will inevitably be with us for many more months and perhaps years, too, but it is one which must be given the closest attention in today's operations and the future's plans or it will handicap the fine safety and service records which the American railways can otherwise set.

The railway jaloppy is as great a barrier to freight service progress and operating economy as it is to safety. Let all railways join in a united effort to get the jaloppies off the tracks and converted into "heavy melting scrap" just as fast as new cars can be provided for replacement.

The increasing number of accidents directly or indirectly traceable to hot boxes is a problem closely related to the railway jalopy. Hot boxes are a problem of much greater seriousness than they are usually recognized to be. There is no single thing which will contribute more completely to safety on the rails than to reduce hot boxes to the status of really infrequent and extraordinary occurrences. The control of this problem is deserving of the immediate continued study of highest technical abilities which the railways and the equipment industries can marshal for this important work. Meanwhile, redoubled efforts must be made to establish better hot box preventive maintenance practices.

Good housekeeping on the railroads has been a virtue more honored in the past by its breach than in its observance. The term "good housekeeping" is meant to imply order and cleanliness throughout, not on passenger trains and in stations alone, but throughout all railroad property. Let me pause to state that this distinction between railway property assigned to passenger and to other uses was not intended to imply that the housekeeping standards of the former are generally inadequate. There is plenty of room for improvement in those respects, too, although since it represents the "parlor" of railway service, whatever state it may be found to be in represents the best housekeeping any railway will present.

Good housekeeping is a matter of orderliness. Orderliness of surroundings inculcates orderliness of mind in all who work in them. An orderly mind is probably the most effective of all agencies of safety. By the same token an orderly desk, factory or office is an almost essential prerequisite to and indicator of efficiency. It therefore seems doubly important for railroads to stress good order and good housekeeping as essential components of any safety program.



Cleanliness and orderliness are twins; where one is the other inevitably follows. The steam locomotive inevitably made the railroad a dirty place; the Diesel is changing that. The increasing use of the Diesel encourages a degree of cleanliness that is impossible without them.

Order and cleanliness follow one another hand in hand and where these "Gold Dust Twins" work, good housekeeping moves in. As more and more Diesels go into service, railroads will inevitably become cleaner. Less dirt will be produced. Moreover, since dirt does the same harm to a Diesel locomotive that it does to a fine watch, the presence of dirt and Diesels becomes incompatible and dirt goes out. Diesels will therefore both help and require railroads to be cleaner places in which to work and travel. This is another forward safety step which the "New Look" in motive power will produce along with its other benefits.

Good housekeeping makes for safety, efficiency, better service and more friends. This follows the general pattern of safety which is always found in the presence of these good companions, and they soon draw all other business virtues into their society.

Fortunately, progress in the manifold means to prevent accidents has outstripped the rate at which the potential danger of disasters has increased. This is partly due to the cumulative beneficial consequences of having better plant, equipment and facilities and higher standards of efficiency of supervision and training of employees.

The whole tempo of railroad development has been centered around the growth and size of the locomotive. The "Rocket" and the British built "Stourbridge Lion" date back to 1829, just 119 years ago. The capacity of each is around 9 horsepower. The most modern steam, electric and Diesel giants produce 6,000 horsepower. This then becomes the measure of 120 years of railroad progress.

It is my considered opinion that when the National Safety Council holds its 1960 meeting, the standard of the modern motive power of that year will be machines turning out 12,000 horsepower; just double the present maximum.

All railroad progress is measured by the growth of the locomotive. It shapes the development of the rest of the railroad plant which is solely designed to utilize the potentialities of the maximum available power unit. It follows that the next twelve years will witness as much development in railway plant and equipment and facility as has been achieved since railroads began 120 years ago. The ratio of progress will be accelerated tenfold. What then does it require and imply for railroad safety.

Fortunately, the miraculous development of electronic devices is extending the range of man's vision, speech and hearing, holding every promise and assurance that the problem of safe operation of heavier and faster trains will be greatly simplified and improved by these developments. Moreover, the continued advance in every branch of science and engineering and management will produce a myriad of new devices and improvements to old ones which will hold maximum promise for greater railway safety as well as higher transportation efficiency. All of these factors will automatically insure safety being more intensely integrated into the highest strategies of corporate policy.




## Train Accidents

**By D. A. FAWCETT**
**General Manager, New York Central System, Cincinnati, Ohio**

The question might be asked by the uninitiated, "What constitutes a train accident?" "Is it only when heavy loss of life and property is involved?" Surely those are the only ones that come to the attention of the public. The answer is, of course, in the negative as train accidents cover a wide and varied scope and in a great many cases with a minimum amount of damage. There seemed to be a need in years past of a yardstick for determining what constituted a train accident and for reporting purposes

the Interstate Commerce Commission laid down the rule of measurement and in their language it now reads, "An accident with or without casualties, arising in connection with the operation or movement of trains, locomotive or cars, that results in damage to equipment or other railway property in excess of $250.00." There is, of course, no difficulty in interpreting that rule. We should not, however, be unmindful of the accidents that do not come within the scope of this rule and which are in need of our attention.

I have been admonished that the quoting of figures or statistics on occasions such as this should be avoided if at all possible. however, it seems to be quite apropos to indulge in a few recorded facts in order to intelligently and effectively discuss this subject. The only available information as to the extent of train accidents is that which is published by the Interstate Commerce Commission and, of course, is based upon their formula which I have just mentioned.

Let us review the record of the number of such accidents reported by the steam railways of this country to the Commission. We will only go back as far as 1941 where we find a total of 9,401. In 1942 this rose sharply to 13,380 and again a substantial rise in 1943, 1944 and 1945 where we find a total of 16,892. In 1946 there was a slight decline, but we ended up the year of 1947 with 16,816. *Let me repeat, the 1941 figure of 9,401. The 1947 figure of 16,816 shows an increase of better than 75 per cent. With the increased traffic during the war years and post war period we could expect a rise in these figures, but it seems accidents have far out distanced the traffic in this seven year span.*

This leads up to the question of what factor was the principal cause of these accidents and looking into the records further we find that the most serious offender was negligence of employees. Of the total accidents reported in the year 1947 (and I again repeat that figure, 16,816) *7,090 of them or better than 40 per cent were chargeable to employee negligence.*

How does this compare with previous years? In 1935 this percentage was down to approximately 28 per cent. From then on there was a steady rise to 1942 when we reached the astounding figure of 46 per cent. There has been some decline since that year but far from satisfactory. What should be done about this? The answer lies entirely with those responsible to see that there *is proper obedience of the rules. The record would indicate that there has been a relaxation in this respect.* For train and engine service employees this responsibility rests largely with trainmasters, road foremen of engines and yardmasters. Frequent observations in the way of surprise or efficiency tests are of prime importance and just as important is the administering of discipline to the offenders.

We are all familiar with the investigations conducted by the Bureau of Safety of the Interstate Commerce Commission of certain train accidents and the thoroughness of their conclusions. The latest available information of these investigations is found in the report of the Director of the Bureau for the fiscal year ending June 30, 1947:

It was observed that during this twelve month period they investigated a total of 114 accidents. Of this number seventy-four were collisions causing 132 deaths and 1,841 injuries. The remaining forty were due to derailments with 82 fatalities and 1,143 injuries. Let us look further into those 74 collisions—18 of them were head-on, 23 were rear end, 14 were side collisions and 18 were classed as miscellaneous. The Bureau delved further into this and listed the principal causes of *these 74 collision* cases and there were many; but I desire to call your attention to the fact that *twenty-nine were due to failure of trains to control their speed in accordance with signal indication or existing rules and instructions.* To me this is an alarming figure, as it is to you. Should we not ask ourselves, what is being done about it, or perhaps it would be more pertinent to ask *what are we doing about it?*

I believe it can be safely said that management, to the best of its financial ability, is doing its part in providing devices that will provide improved operation. In 1910 there were but 13,000 miles of railroad equipped with automatic signaling. This has risen steadily until today we find approximately 73,000 miles so equipped or nearly 70 per cent of the mileage. If we should measure this in miles of track we would find approximately 105,000 miles or



over 75 per cent of the total. While this is no doubt the most far reaching development in modern operation there are many other facilities being put into service such as train control, cab-signaling, radio, train communication system, car retarders and Centralized Traffic Control. The latter is perhaps the most modern device that has grown from the automatic signaling system. Centralized Traffic Control has had a most rapid growth, greater I believe than any other in the signal field. In the twenty-one years since its birth we find 10,000 track miles of railroad so equipped.

Millions of dollars have thus been expended by management in providing these modern facilities, not alone to provide a more economic operation but also to provide a greater degree of safety. These tools have been placed in our hands and *it is our duty to see that they are properly and efficiently used.*

However, with all the automatic and foolproof devices at our disposal we still have an important factor to deal with, perhaps it should be said the most important of all, and that is the *failure of the human element. It is here the supervision has a real obligation.*

It has been said, and rightly so, that the *difference* between good and bad operation of the railroad is the obedience or disobedience of the rules. But, are we doing all within our power to properly educate the employees on rules? In the operating department of practically every railroad, annual and sometimes semi-annual, classes are held on the rules. I have heard them classed as examination classes and on other occasions instruction classes. Surely the latter is the proper classification. Examination classes serve their purpose for upgrading employees, but what I am interested in at the moment are those classes which will impart knowledge to the employee as to the right and wrong application of the rules and not necessarily a quiz gathering.

Some railroads are using slides, projecting the rules with corresponding illustrations on the screen. Others are making excellent use of motion pictures. Surely these are beneficial, not only in an improved method of explaining the rules, but it should serve to create an interest on the part of the employee which may not otherwise exist. In the oral part of these classes the employee should be permitted and encouraged to enter into the discussion. Questions should be solicited and by all means the instructor must take precaution to clearly answer all such questions. *The average employee takes pride in his work; he wants to do the job correctly; it is our duty to see that he is given every opportunity to properly educate himself.* My reference to the rules has been pointed mostly to operating rules, but the cloth should be cut in the same manner for other employees whose duties are in some measure responsible for the safe operation of trains.

While I may be straying somewhat from the immediate discussion I should like to dwell a moment on the employing of new men. We, of course, have our physical requirements which are usually rigid, and I believe we should be just as thorough in other requirements of the applicant. He should have at least a high school education, and of good character and habits. After employment he should not be cast adrift to "sink or swim"; instead we must keep in contact with him either directly or indirectly to make sure he is started on the right path. Too often negligence in this respect makes a poor employee out of a potential good one. I believe the inducements offered by the railroads today permit us to be quite particular in our employment program.

Just recently I was privileged to see some statistics comparing the safety of rail traffic with that of air carriers. No doubt you have also seen these enlightening figures. These figures covered an eighteen year period, 1930 to 1947, and revealed that over this span of years there were 886 passenger fatalities on the railroads with a ratio per one hundred million passenger miles of .12610. As for airplanes in this same period there were 773 passenger casualties for a ratio on the same basis of 2.9.

However, we must not be boastful over such accomplishments, nor over the fact that American railroads provide the safest form of transportation today. Instead we must be continually striving to find new ways and means to bring about improved train operation with the resultant decline in train accidents. Other forms of transportation are challenging us—we must and will meet that challenge.



# Train Service Accidents

By FRANCIS B. LEWIS
Superintendent of Safety, Union Pacific Railroad Co., Omaha, Neb.

In very recent years I have been drawn to the conclusion that the mental outlooks of safety organizations are geared directly to train service accidents—that the heights of ecstacy and depths of despair are associated closely with the absence or multiplicity of accidents of this type. And it's quite logical, too. The fallibility of workers is so vitally involved. To this are added the adverse elements that are often a hindrance to their natural care.

All of us know what types of accidents are most frequent. We also know which are usually serious. And we also know of the futility that surrounds some of them. You expect each month that employees will sprain ankles getting on an off equipment and while engaged in other routine duties. We are inclined to accept this type of accident as inevitable to some extent, because we can't seem to do much about it, and there does not appear to be anything in the offing to give us reason to believe a solution is coming.

I want to deal with accidents arising from falling from cars, because something can be done about them. Accidents from this source are frequently serious and sometimes fatal. We have them every month, and we accept them with a degree of resignation. Numerous posters, hand brake exhibition cars and countless hours have been used to show and encourage the field men in the safe way of operating hand brakes and moving about cars.

All of these measures have been helpful to the extent the worker will absorb the teachings and his physical fitness to apply the teachings. In spite of all this we have a repetition of these accidents day after day.

Let us look into a typical accident where a man has fallen from a running board. A man's safety on the running board of a car is related to his sense of balance, his agility, his disposition to exert effort to be safe, his intuition to know when to expect unusual movements and his ability to withstand them.

A man's safety when operating a hand brake from a brake step is largely contingent upon his ability to hold fast to the roof hand hold or his disposition to do so. After an accident, who is to be the judge and who can say he wasn't doing his best?

The most precarious place for a man to be on moving equipment is on the brake step. When he falls he usually goes all the way down. Most men are right handed. The grip in the right hand is firmer and better coordinated—yet when operating a hand brake the left hand must be used to grasp the roof hand hold. Of course, it is true that modern power brakes can be fully set with one hand. This leaves the left hand free to grasp the roof hand-hold. You must depend upon the grip in your left hand to withstand the dislodging influence of a sudden unexpected car movement.

Let us take the brake step, approximately 28 inches in length and 8 inches in width. When you operate a brake you assume a position allowing one foot to remain on the brake step and the left foot on a ladder tread.

The only usable portion of the brake step is that part that extends beyond the wheel toward the end ladder side of car. You cannot relocate the brake step, because its outer end now extends to ladder tread clearance.

The brake step was conceived as a needed facility to make it possible to operate a hand brake of the type where brake wheel and related parts did not permit its use while standing on the roof of car. That was regarded as sufficient arrangement at the time when safety appliances were born from the standpoint of necessity and regarded as a radical step and departure from the standards of the period.

We have improved hand brakes, and we can improve brake steps. The design of high-power hand brakes has resulted in a better and safer brake to operate. The brake step is now being made of metal, which is vastly superior to those made of wood. Now we should give attention to its size and location. The practical way and the only way to insure a positive reduction or elimination of any type of accident is to make it virtually impossible through protective means for a man to get hurt when performing that particular operation.



You encounter somewhere the fallibility of man when you depend alone upon the urge to be safe. This principle is seen in the various protective devices applied to machinery so designed to make it impossible for the operator to get hurt.

It is the fundamental purpose and aim of safety engineers throughout the country. First explore the possibility of arrangement whereby it is impossible to get hurt—second surround the remaining situation with appeal, instructions or laws to control that which cannot be handled otherwise. Subways for pedestrians, overhead and underpasses for vehicles are the outgrowth of study to prevent accidents.

The automatic coupler was the fruit of this type of thinking; so was the automatic air brake to control trains. And the present high power hand brake is the culmination of efforts directed to produce an efficient hand brake.

To carry this thought on it should be consistent to devise means whereby hand brakes can be safely operated without depending upon the ability to retain a grasp on the roof hand hold or the security of footing on a ladder tread.

In the analysis of injuries occurring through engagement in any specific operation we are guided by the frequency of such injuries and the circumstances. After elimination of so-called cycles, trends and other factors of doubtful value, we are faced with the issue of doing something about it if we have a chronic condition. Repetition of accidents arising from a routine job means either we have failed to impress the workers with the need for personal care, we have not made it safe to handle that particular job, or the elements of human frailty associated with the operation can be expected to produce accidents.

The hand brake can be surrounded with a virtually fool-proof arrangement. Study should be given to increasing the width of the brake-step and increasing the usable length to permit both feet to be placed firmly on the step. This will give the operator a secure footing with both feet on a level support, which is the first fundamental requirement in attempting a lift. Increasing the usable length of brake-step will either involve an encroachment on Interstate Commerce Commission end-ladder clearances or necessitate relocating the hand brake toward the center of the car sufficiently to avoid end of brake-step projecting into the continuity of end-ladder clearance.

A railing approximately hip height can be attached to the steel end of the car to enclose the outside edge of the brake step. This will provide a definite measure of security to avoid falls which result from the operator losing his grasp or his feet slipping. Such a railing would encroach on the Interstate Commerce Commission requirements for end clearance because in order to permit the operator ample room to move about it would be necessary to have the railing flared outward from the edge of the brake step. This encroachment is more of a point of view, than otherwise, as at present the operator must of necessity, due to his breadth, extend a portion of himself beyond the imaginary clearance line. It would be possible to increase the clearance and stay within the I.C.C. regulation by modification in coupler striking castings to preserve the present end clearances.

The problem of applying a railing to running boards does not pose any special insurmountable problem. With something to grasp at convenient height, the trainman can guide himself safety over cars day and night, regardless of weather or under foot conditions or the unexpected movement of car that is usually associated with accidents of this type. This railing would not strike overhead structures during train movements but would require some changes in sheds and other fixtures in some industrial track where at present there is inadequate clearance.

In 1863, when the first Pullman car containing upper berths was built, some railroads found it necessary to reduce widths of station platforms and overhead structures before a car of that type could be operated over their lines.

These measures cannot be handled tomorrow. They should be contemplated in new equipment to keep pace with the needs of humanity—to lend a helping hand to those we are anxious to help. From a

cost standpoint aside from the humanitarian angle we can't afford to neglect it.

In Europe they provide a complete structure enclosing the hand brake—a country where for the past generation life has been pretty cheap. Yet their original conception of comfort and safety for trainmen was more encompassing than ours.

The things to come that appear strange and fantastic today will be commonplace tomorrow and those innovations that enhance *safety of workers*—the product of concern for fellow men—will serve as a measure to those to come of our effectiveness today.

We must if we are to be worthwhile be daring enough to think beyond tradition. We must think in terms of tomorrow for changing railroad technique.

The Association of American Railroads has a Committee on Safety Appliances which is concerned with the safety features applied to railway cars. They are anxious to improve the facilities provided to safeguard railroad workers. The safety organizations on the American railroads by virtue of their intimate knowledge of accidents and their supporting records are the logical sources to furnish recommendations to this committee on matters they deal with. Through concerted action and prevalence the metal running board and hand brake step were adopted and in years to come these appliances made of wood will be only a *memory*. An additional side hand hold was applied to cars because experience showed it was essential to safety.

Only for the lack of experience were these changes omitted from the original requirements. And today we have sufficient experience behind us to justify a thorough exploitation of constructive measures that will make it safer for men to operate hand brakes and safer to move about on the tops of cars.

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# Train and Train Service Accidents

## A Panel Discussion

*Discussion Leader:* D. E. MUMFORD, Superintendent of Safety, New York Central System, New York, N. Y.

*Participants:*

**The Importance of Teaching and Training**
W. H. BAILEY, Superintendent of Safety, Missouri Pacific Lines, St. Louis, Mo.

**Observance of Signal Indications**
A. E. DAVIS, Superintendent, Department of Safety, Chicago, Burlington & Quincy Railroad Co., Chicago, Ill.

**Operating a Hand Brake**
G. M. DEMPSEY, General Inspector, Division of Safety, Chicago, Milwaukee, St. Paul & Pacific Railroad Co., Chicago, Ill.

**Motor Car Accidents**
R. C. SABENS, Safety and Fire Prevention Agent, Nickel Plate Road, Cleveland, Ohio.

**Yard Accidents**
J. R. THEXTON, Superintendent of Safety, The Delaware, Lackawanna & Western Railroad Co., Hoboken, N. J.

**Preventive Maintenance**
J. P. WADSWORTH, General Safety Supervisor, Canadian National Railways, Montreal, Que., Canada.

### The Importance of Teaching and Training

MR. W. H. BAILEY: *Train* service accidents are usually caused by the failure of some human being, either from non-compliance with rules and regulations or the absence of ordinary care and good judgement. On most American railroads, a very intensive teaching and training campaign has been underway for several years.

Under this program, supervisors are trained by attending instruction classes under the direction of an experienced teacher who usually is an employee with wide experience in train operation. He is also qualified as a student of human nature.

As we have learned, the most effective leadet is a person who can exchange ideas with the man in the field and make that person realize the importance of his position, the necessity of doing his best—making the individual feel that he is appreciated, and cause him to realize his part on the team. The most effective leader is a person who thinks through all of his problems, knows the qualifications of his men, using the best or the more experienced for the so-called difficult jobs, pointing out certain things to watch for or guard against. The leader with these qualifications frequently works for a long period of time with unusual success and in many cases, his effectiveness is unnoticed by supervision.

Men are no different now than they were years ago. They still react to recognition. They likewise hate to admit an error or a mistake. But, a word of praise, lifts the individual to his feet. His reaction is, "Well, possibly I am important." Then, he usually decides, from now on, I will try to be more careful and do a better job.

Some men do not know whether or not they are doing the right thing. Why should they, unless supervision expresses appreciation or criticism? All employees must be led. Supervision must be firm, but fair. When a mistake is made or a rule violated, correction should be made immediately. Talk to the individual in private. Show him his mistake, and explain in detail the importance of compliance. Make the job attractive by a little more humor on the job. Create a team spirit with the men in any capacity. Keep them on speaking and working terms with each other.

A certain industry decided that they would stop the men from spitting in the corner of the building by painting all the corners white. What did the men do? They just spit somewhere else.

When leadership of the proper caliber makes up its mind to lead the employees, recognize some of their accomplishments, men will be more thoughtful on the job and accidents on train service will certainly be reduced.

### Observance of Signals and Their Indications

MR. A. E. DAVIS: There are two reasons for my choice of subject. First, because it was a very important phase of a general subject for train accidents, and, secondly, because in 1945 the most disastrous accident, after almost one hundred years of operation on the Burlington Railroad, resulted from failure of an engine crew to obey the restricted indication caution signal. Forty-five lives were snuffed out in that accident, and seventy persons were injured.

I make that brief reference to emphasize the seriousness of the subject before us.

According to the Interstate Commerce Commission Accident Bulletin No. 116, which is a summary of an analysis on steam railroads in the United States for the year 1947, negligence of employees counted for 42.16 per cent of all train accidents reported to the Commission. And one of the principal causes of accidents wherein negligence was a factor was disregard of signal indications.

There were 223 accidents due to disregard of fixed signal indications, resulting in the loss of life to 12 persons and injuries to 326 persons. Negligence due to improper execution of hand signals caused 430 train accidents last year, resulting in three deaths and 32 injuries.

Every signal, be it a hand or a fixed signal, tells some train or engine man, something. It indicates to him a condition affecting a train or a switch movement. There isn't anyone on a railroad that knows this better than the train and engine man, and no one on a railroad knows better than they, the disastrous results that often follow their failure to observe, to obey signal indications.

What causes men to disregard signal indications? What causes an engineer to fail to reduce speed at a caution signal despite a restrictive indication? Why does he not reduce speed when he sees that signal displaying the restrictive indication, to the stop signal, or where he can determine the position of the stop signal, at reduced speed? Is it because he is deliberately careless and he wants to deliberately, intentionally and willfully violate the rules?

No, I don't think so. I think we are going to have to look elsewhere for the cause. Did it ever occur to you that possibly it is because of his eagerness to make the time, keep his train on schedule, and do as well as the other fellow? And, the false belief that if he ignored the signal and got away with it, everything would be all right—nothing would be said?

It is a fact that oftentime, when that occurs and nothing happens, nothing is said. In fact, sometimes the boys are given a little pat on the back for making a good run. Did it ever occur to you that possibly other members of the crew are leaving it up to George to keep them out of trouble, instead of calling the signals; clear board, red board, yellow board, whatever it might be? They are just leaving it all up to the engineer, and he is a human being just like the rest of us. Whereas, if we had teamwork, where everyone was on the job, tuned in, helping to run the job, everyone would keep out of trouble.

Assuming that our signals are properly spaced so that an engineer can bring his train to a stop at a signal displaying the stop indication, failure to do so can only be attributed to one thing and that is, failure to observe and comply with the rule that requires speed be reduced when you find a caution signal displaying a restrictive indication.

I say again, that is what caused the deplorable accident on the Burlington a couple of years ago. The engine crew could see *the distant caution signal as they approached* it. They could see it displaying a restrictive indication. It was located a sufficient distance from the stop signal to have permitted a service application of the air brake, bringing the train to a stop before reaching the halt signal. But no, the boys figured by the time they got around to where they could see the other signal, it would be clear. Everything would be all right, so they disregarded this signal.

In my opinion, of the two signals, the stop signal and the caution signal, in many respects, the caution signal is the more important. If our boys will properly observe the restrictive indication displayed by the distant signal, they will never get in trouble or get by the home signal.

The surprise check or signal test has been very effective on our railroad in keeping men alert and on their toes. Beyond doubt, these checks if conducted fairly, are helpful in bringing about a better observance of the rules. As already indicated, I do not believe all negligence is due to willful or *intentional violation of rules*, and accusing men of being careless and indifferent, threatening them with discharge when they do something that is wrong, isn't going to change their ways.

Some men are prone to err. In fact, to err is human, and although it is often said you cannot change human nature, I believe that if we will, by educational methods, instill in our employees the desire to be safe, the desire to observe the rules, we can stop a lot of accidents.

But, first, we must prove to the men that we are sincere in this safety movement by practicing what we preach. Moreover, we must be able to understand men and know how to handle them, keeping in mind, the two cardinal virtues of handling men are fairness and firmness.

The first requisite of the *safety officer*, or any officer, for that matter, is to win the respect and confidence of the men. That cannot be done by continually telling men that they are careless; that they are indifferent. In the first place, the word careless applies to something you have done intentionally or willfully, and I don't believe the men do the things wrong purposely, or intentionally. How much nicer, easier, and how much better it is, if you sit with the men, if you just use the expression, lack of care, lack of forethought, instead of using the word careless.

Every operating officer knows, and every safety officer should know the rules for the safe operation of a railroad and certainly, no credit applies to you for discharging men. The credit goes to the officers who build up an organization of *safe, loyal and* efficient men.

I don't want you to think for one moment that I don't believe in discipline, because I do. Nothing is more essential to the safe operation of a railroad than is good discipline. *But, to be effective, it must be ad*ministered fairly and justly. In fact, the effectiveness of discipline is found in the certainty of it rather than in the severity of it.

*You don't have to beat a child to discipline it, and I don't think you have to* severely discipline a man in order to get across a safety message. From my experience in training service I am convinced that train service men appreciate their jobs, that they want to do the right thing, and further, they have a keen appreciation of their responsibilities.

From the day the train service men enter the service, they are schooled on the operating rules. They are taught to obey the rules, to respect the observance of signals, flagging, whatever it may be, and they are taught to take the *safe course in case of* doubt or uncertainty. Generally speaking, these men are above the average in intelligence and also in skill. These boys are out here running our trains, and they are doing a good job of it, despite the fact that we have accidents now and then. What they need is a little pat on the back, a kind word, instead of giving them hell every time something goes wrong.

Nothing I have said has been intended as a eulogy to the train service men. I realize just as well as you folks that you can't run a railroad on sentiment or emotion. Neither can you run it by instilling fear in the hearts of men. It takes real cooperation to run a railroad safely and efficiently, and cooperation comes from dealing fairly and justly with men in each and every *situation, and I am* unable to understand any other viewpoint.

I have a letter here which I would like to read. It is dated, Chicago, October 14, 1948, and it is signed by sixteen local chairmen of the various railroad organizations on our Chicago Division. It came unsolicited out of a clear sky, in the mail yesterday morning. The letter shows that in the final analysis, the secret of safe railroading is personal contact with these men, letting them know you are interested in them and that is along the lines this letter is written. It is addressed to the officers and members of the Safety Department of the Chicago, Burlington and Quincy Railroad.

"Dear Sirs:

"Please accept this as a testimonial of our great appreciation for your untiring efforts in the program of safety on the Chicago Division in the past year. And, may the representatives of the Chicago, Burlington and Quincy Safety Department go before the Thirty-Sixth National Safety Congress with the full confidence of the rank and file that they have no superiors or few equals in the promotion of safety in the railroad industry."

### Operating Hand Brakes

MR. GEORGE DEMPSEY: Yesterday at the meeting, Tom Carrow passed out some fine statistics for the first six months of this year as compared with the same period a year ago. It showed, under the train service caption, that there was an increase of one fatality in the operation of hand brakes, and a very tidy little decrease of 183 reports of injuries, or 24 per cent.

I should like to start from the beginning rather than talk about the situation as found after the train man reaches the hand brake location. First, it is necessary to safely board the car, which may be standing or moving, and when moving, the speed may vary considerably. Perhaps it is dark and the train man is carrying a lantern. Perhaps, a brake club, too. If it's raining he may be wearing a raincoat which may restrict his movements. There may be a sleet storm, or snow and ice on the group, on the stirrup, and ladder rungs and brake platform. Then, too, he may be young and inexperienced, yet agile. Or, he could be an old-timer, with plenty of experience, but lacking in agility.

*Of course, from* a statistical standpoint, this would not fall in the category of operating hand brakes. Nevertheless, it is all part of the operation of getting up to that job.

For that same six-month comparison in those statistics, we find an increase of two fatalities, a decrease of 303 injuries, or 14 per cent. Let's go back to our brakeman. Now, he starts to climb the ladder. It is not placed at an angle such as would be the case with a portable ladder, but straight up. When he has ascended to a height of seven or more feet, he cannot expect the protection of a ladder cage such as is required in many states by law, where fixed vertical ladders are involved. He must rely entirely on secure footing and on his ability to hang on.

In climbing a box, auto, *stock or refrig*erator car, he must climb to a height of 11 to 14½ feet in order to reach the brake platform or the top of the car. On many railroads where such heights are involved, permanent scaffolds with handrails are provided.

It is necessary to climb around the corner of the car to the end ladder. All the while the car is swaying as it moves along the track, possibly over a low joint or two on its way.

With his left foot on the ladder rung, he now steps over with his right foot onto the brake platform, having minimum measurements of eight inches by twenty-eight





inches. He must immediately size up the situation, because he does not necessarily have any previous knowledge as to the type of brake on the car. Time may be an important factor, due to the car moving on a track on which other cars were standing.

He must carry out the duty he started out to perform when he boarded the car. He may find the horizontal wheel staff brake, a vertical wheel power brake or a lever type brake. If a power or lever type, he places the brake club on top of the car, because he remembers that a power brake does not use a brake club. If it is a horizontal wheel type, he must place himself in position with both feet on the platform and, if necessary, insert the brake club through the wheel and against the brake staff.

.e old-timers are more familiar with the horizontal wheel type brake and seldom are injured handling it. Most of their troubles are with power brakes and, to some extent, it is just the opposite with the younger men in the service. Imagine the predicament a young switchman may find himself in while riding a car in on a yard track on which he knows other cars are standing, and there he is with a power brake he knows nothing about. Such a situation can occur and probably has occurred many times on all railroads.

What is true of high cars is likewise true where open top tank or flat cars are concerned. Much of the action incident to setting a hand brake is likewise carried out in reverse when releasing the brake. In other words, you have to get down off the car. Side and overhead clearance restrictions and operating conditions may prevent changes in car construction to a large extent. So, we must rely on the individual involved until such time as improvements in car construction are made.

I have a great deal of respect for the hazards inherent to the brakeman's job. Training the new man and reminding the old-timers is a responsibility we must recognize. In the operation of hand brakes, it is necessary to emphasize the extreme importance of a good hand hold on the safety appliances provided. The actual handling of the various types of brakes in order to become familiar with them is most desirable for the prevention of accidents. Numerous means for carrying out such instructions have been employed on the American railroads, but on the Milwaukee Railroad we have found our hand brake instruction car of inestimable value in that respect. Since the Spring of this year we have had approximately 4,500 trainmen go through that car and receive instructions.

We have heard it said that a railing might be installed around a brake platform. There have even been comments in the past about taking the side ladder or the end ladder, preferably the side ladder, I presume, and extending a railing up to the roof of the car such as you have at the rear end of an engine tender. We have heard all sorts . ' comments about safeguarding the man after he has reached the top of the car or the brake platform. Might I throw out one more thought?

With the new types of geared power brakes that are coming into vogue on all new car construction, perhaps someday, the ingenuity of the mechanical people on the American railroads will figure out a way whereby these geared mechanical power brakes can be mounted and, if necessary, recessed to a certain extent into the side of the car just to the left of the side ladder. When we reach the point where the geared power brake can be handled by a man on the ground, we won't have men falling off the brake platform.

I was happy to hear from Leonard Hoffman that the safety officers and the mechanical officers of the A.A.R. were going to give consideration to this power brake subject.

When you start to consider there are approximately 30 or more different types of brakes on cars with which the switchman and the trainman must become familiar, surely it is a subject worthy of consideration. I believe that there is enough ingenuity among the mechanical officers on our railroad to develop a method of putting the hand brake or the powered gear brake on the side where it can be operated from the ground, or next best, while the man is standing in the stirrup of the side ladder.

### Motor Car Accidents

MR. ROY SABENS: Each year, we have many accidents on the railroads caused by motor cars being struck by trains, and if we are to eliminate these accidents, we must improve the team play of our employees. The Interstate Commerce Commission investigated 25 accidents involving motor cars and trains, which occurred between the years 1935 and 1946, inclusive; 31 fatalities and 56 injuries were sustained on account of these 25 accidents. Seventeen of these accidents were caused by failure on the part of the motor car operator. Nine of these 17 accidents were the result of motor cars being operated on the time of first-class trains. Seven were due to the failure of the operator or dispatcher to restrict trains or give correct line-ups. One of them was due to the failure of the flagman to flag as instructed.



During 1947, and so far this year, on our railroad, we have had 21 accidents involving trains and motor cars, of which two resulted in fatalities. One was caused by the motor car being operated on the time of a first-class train. The other was caused by a makeshift seat on the back of the motor car, so that when the section man jumped from the car, he landed in the center of the track and was run over.

Eighteen accidents resulted from a failure on the part of the motor car operator, such as poor judgment in figuring the running time of freight trains. Two were on account of incorrect information being furnished as to the movement of trains. Another was caused when a conductor pilot overlooked a first-class train. A signal maintainer had been advised to search for a signal failure. He found a hot wire was down across the ridge, and he was greatly concerned as to the danger to himself and others until he had removed this wire. After he had removed the wire, he then proceeded to repair the signal apparatus and while returning to the job on the motor car, overlooked the first-class train. Even his helper did not do his part and look behind. This accident which resulted in a fatality could have been prevented.

Another signal maintainer going west did not ask for or receive information in regard to eastbound trains. He was advised as to the movement of the westbound trains. He entered a controlled siding to clear the track for the westbound train following him. The westbound trains were being handled through the siding in order to meet the eastbound train and the motor car was struck and demolished by the westbound train.

A patrol man received a lineup of a train and the lineup indicated there was a northbound train coming. When he asked the operator at the next station in regard to it, the operator told him that the train had not been caboosed in the yard a short distance south, so he continued on south, figuring he had plenty of time, but met the northbound train a short distance from the station and the motor car was demolished. As it turned out, they were caboosing another train which was following the one that struck the motor car.

A section foreman asked for a lineup of a dispatcher at 3:35 p.m. and was told that a train had just passed a few miles east of him at 3:09 p.m. He put his motor car on and was struck about one and one-third miles from where he had received the lineup. Figuring the running time of this train, it should have passed the location where he was hit at 3:34 p.m., one minute before he asked about the location of the train. Nevertheless, he operated the motor car in the face of the oncoming train.

If we are to reduce the number of motor car accidents involving trains, operators of motor cars must not be allowed to place motor cars on the line until written lineup is received from an operator or, correctly, from a dispatcher. These lineups must show the name of the motor car operator, the time and location of all trains in that territory. These lineups must be repeated.

Many times, operators and dispatchers have discouraged a motor car operator in asking for lineups, but the written lineups will make the motor car operator, the dispatcher and the operator more conscious of the fact that human lives depend on correct information and good judgment, in the figuring of the time of the train. Also, the day of smoke is over since the diesel engine is being used on many of our railroads.

Several years ago, it was understood by every motor car operator on our railroad that whenever anyone had a motor car struck by a train, that he was through working on our railroad. And, the result was, we had practically no train accidents involving motor cars at that time. Every motor car operator on our railroad is being furnished with a portable telephone and is instructed that he must contact the dispatcher before placing his motor car on the main track.

We hope, through this practice and the use of the written lineup on the prescribed



form and also by the application of discipline, to eliminate train accidents involving motor cars on our railroad. We must have teamwork in the operation of motor cars if we are going to prevent such accidents.

The foreman in charge of motor cars must have other employees on the motor car read the lineup and have an understanding as to what the plan of operation is going to be. Many accidents which resulted in fatalities could have been prevented if only one of the employees on the motor car had been part of the team and had looked back for following trains.

Train accidents involving motor cars can also result in injuries and fatalities to enginemen and trainmen on the train, and in the case of first-class trains, a possibility of casualties to passengers. We should do everything in our power to eliminate this kind of accident or we will receive an order from the Interstate Commerce Commission which will require that motor cars must be run on train orders, and I am sure we don't want that.

### Yard Accidents

MR. J. R. THEXTON: Safety is the watchword of American railroads. There has been a continuous improvement of safety records and that is the objective of our railroads. As a requisite to safe operation, we must consider train supervision.

When a switchman operates with safety and according to the company's policies, he is a direct reflection of the yardmaster's attitude. The yardmaster must be fully in accord with the company's policies on safety and their operating rules. He must have a sincere interest in the welfare of his men. He must have the respect and confidence of these men. He must know his job. He must know the hazards that are inherent to it and know what safety practices to apply to it. He must be a man of open mind, one who can receive suggestions from his men and explain satisfactorily to them, any suggestions on the job.

He must have the background to insist that safety policies are carried out and at the same time, not be brutal or offensive in his discipline.

These specifications should be considered as a list and turned over to the superintendent or train master or those who are responsible for the employee.

In some railroads, the jobs are bid from the switchman's roster, but on our railroad we appoint the men who are best qualified for job. And, we do make mistakes, because none of the men answer those six qualifications that I feel are paramount to their job assignment.

I speak of the yardmaster as the key man in the yard operations and in the safety of the yard. The yardmaster tries to bring his men into line with his policies of safe operation. As directors of safety we should establish some form of training program for yardmasters on the workable methods of administering safety to the men under their direct supervision in yard service. When this has been done, the yardmaster is imbued with the fact that he is the key man in eliminating personal injuries in his particular territory and he will be sold on the idea of building safety into the daily job. Then we can be assured that when a new man is hired in this field, he will be instructed very thoroughly on the methods of safe operation. He will not merely be assigned on his own, with a lamp, a book of rules and a brake stick put in his hand, and be told to be careful, as has been the practice in past years.

To the newly-hired switchman, his instructions are never complete until he is trained on the various brakes and the operation and construction of each, by a competent man, a car man, on our property. It is a "must" on the Lackawanna; we insist that new men who are hired for the yard service spend some time with the carmen and get instruction on the various operations of those brakes.

The yardmaster has an extensive influence in controlling a yard operation and he should be reminded from time to time of the importance of elaborating on some of the safety rules.

We have, on our property, the rule of the week, which is posted by our operating superintendent, and also through our shop, and we have endeavored to enforce that. The supervisors check the men and find that they have read the rule and know what it means. They should be impressed with the fact that any deviation or violation of the rules will not be tolerated, and a strict compliance is mandatory.

We should, at every opportunity, emphasize the point of thinking on the job, and at



no time should the supervisor let himself get out of the habit of the follow-through process of checking his men as to whether his frequent instructions in safe conduct in operating switches, getting on and off cars, coupling cars and many other duties necessary to yard operations are being obeyed. This constant driving by a trained yardmaster sows the seed of safety. It never fails to bring certain desires among the crew to look forward and seek daily messages on the subject, with the result that self-preservation becomes desirable and a great amount of pride is created, established, maintained and directed to avoiding accidents and injuries.

Accidents in yards can be controlled by our having what I say is the key man of any terminal, the yardmaster, properly supervised and checked. He will be told to follow through and be made to investigate his own actions, not leave it to the trainmaster who is the higher ranking officer in the respect of territory, but to make out what we call the four form, and tell us the cause and what is being done to correct it. They didn't like it at first, gentlemen, because they thought they had enough of a job in the train yard to dispatch the highball and get them out of town; see that the tonnage was properly tabulated and that he didn't get in the yard office along there with the caboose and have them stall on the hill.

One of our trainmasters in talking to me some time ago said, "Boss, I've got a little message I would like to have your permission to put up in my territory for my boys to have a good record." It is a switching district in the cement country.

I said, "Go ahead, it won't hurt."

And, he put the sign in all the cabooses where they hadn't had an accident. This was a trainmaster's message to the crew and to the fellow working with the fellow who was safe. He put it that way:

"This is a safe crew, and, brother, to keep it so
Is strictly up to you and you.
So be careful what you do.
Don't mar the record of this crew.
Practice safety first yourself.
Watch the worthy brother and keep him off the shelf.
And when you see something that might cause disaster,
Tell it to the trainmaster for what it's worth to you."

He got out those posters and put them in the cabooses. There were some smiles about it, but the conductors were soon saying, "Did you read the poster? Well, we don't want you to get hurt."

### Preventive Maintenance

MR. WADSWORTH: In approaching the matter of the control of train and train service accidents, there are two positions which we must consider; that of the shippers, and, of the railway.

The shipper prepares his goods for movement and expects prompt, efficient service, with delivery at destination without damage or delay.

The railway solicited the business and is being paid for this type of service, but a failure on the part of an employee, or a train accident, causing delay or damage embarrasses the railway to the degree of payment. This covers loss and damage, injuries or fatalities, and loss of the experience of the workmen affected. In addition, the incident may jeopardize the future business from many shippers.

Therefore, an on time, safe performance is essential to the railway side of this transportation business.

There are many conditions that contribute to these failures, such as delay at connections, switching, marshalling the train, inspection, brake tests, condition of the track, and the handling by the train crew.

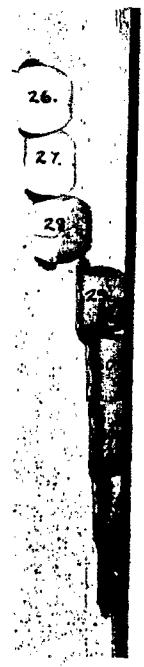
For the purpose of this discussion I am confining my remarks to the inspection and maintenance of the equipment.

*The Car Inspector*—(a) He should be selected from the carmen, preferably trained through the apprentice system.

It is essential that he is physically fit to work in a train yard, and has passed the periodical examinations on vision, color sense and hearing.

(b) Training as a carman on the repair track is important, and he should be instructed on the A.A.R. rules of interchange, loading methods and safety appliances.

This should be accomplished by regular class instruction and followed by practical demonstration on cars, preferably on a repair track where the defects are always evident. With all the rules, etc., for inspection and maintenance there are nearly 2,000 pages, so you can readily see the need of



segregated instruction for the type of work covered by the assignment to each inspector.

The maintenance of safety appliances is a most important matter, and we should educate the inspectors to a full realization of their responsibility in the protection of their fellow workers and employees of other railways, by having all safety appliances in good condition.

(c) It is necessary to develop good judgment and the ability to make prompt decisions. This can only be accomplished by an adequate knowledge of the requirements and confidence in the leadership provided by his supervisor.

(d) The inspector must learn to realize that to a large degree he is in control of the safety of the traveling public, and of the safe movements of freight.

We are all too familiar with the disastrous results of the failure to discover the missing cotter key, defective knuckle lock, brake hanger or pin, and the many types of defects that arise in wheels and axles.

Prevention of accidents from equipment defects requires men trained to detect these conditions, and to act promptly to apply correction.

*Time Element and Protection of Workmen*—In addition to the training and development of the staff, it is necessary to consider when and where the work will be performed, as well as the normal time to be allowed for the service, using adequate flag protection for the workmen.

This requires a joint study between transportation and mechanical officers. If this is not arranged and properly carried out, it is quite possible that a yardmaster with a forceful flow of language will always try to hurry the inspection and brake tests. Trains are made up late and he will expect *the inspector to hurry his work, to help* cover the yard delay.

This is a natural human reaction, as a yardmaster's responsibility usually ends at the yard limit board, but the mechanical department men are responsible for the care and service of the car, until delivered and accepted by a connecting road.

There are five important items that should be arranged:

(a) Inspection on arrival in yard.
(b) Reasonable time allowance granted for the inspection service.
(c) Give empties proper attention, as many of them will be moved to non-inspection points for loading.
(d) Departure schedule to provide time for brake tests and necessary adjustments.
(e) Provide adequate staff for minor repairs in train yard, to eliminate switching delays.

*Light Repair Work*—Many of the train accidents are due to failure of some small part of a car, which could easily have been replaced. We should therefore impress all supervisors and inspectors with the necessity of completing all this work, especially, *when cars* are sent to a repair track.

Checking the following parts will save many a delay or failure:

| | |
|---|---|
| Cotters | Brake Beams |
| Sill Steps | Doors |
| Couplers & Parts | Brake Hanger Pins |
| Test Hand Brakes | Uncoupling Levers |
| Brake Shoes | Wheels & Journals |
| Grab Irons | Adjust Piston Travel |

Waste grabs, which are frequently caused by impact in switching, can be discovered and easily removed when cars are on repair track for other work.

The cost of one overheated and burned off journal will provide a lot of this preventive maintenance.

Keep the car foreman and inspection staff informed as to the results obtained in moving trains over the territory. Arouse and maintain their interest in a good performance.

*Inspectors Alternatives*—When a car is offered in interchange and examined by the car inspector of the receiving road, he has only one of four decisions to make, viz:

(a) Run the car in the existing condition.
(b) Repair it, or send it to a repair track.
(c) Transfer the load and return defective car.
(d) Reject car and contents.

All within the requirements of the A.A.R. rules of interchange.

I have placed these in the order in which we should desire the flow of traffic to be handled, and provide a smooth operation at the interchange points.

It is in making these decisions that the car inspector does his part in the maintenance that prevents the train accidents.



Therefore, safety supervisors and operating officers *should do everything* possible to provide the best instruction and training to such essential key men in the railway service.

Preventive maintenance is far superior to accident investigation, and is of direct benefit to shippers and the railways. It makes it possible to commence your safety efforts at the time the shipment is offered, and provides for a program of work at the terminal where all facilities are available.

The auxiliary outfit with steam derrick is, a costly unit to operate, and pays best when on the siding prepared for an emergency.

In conclusion, would suggest as a first step towards elimination of train accidents, that we study and intensify the efforts to develop and train the inspection forces, using visual aids, safety instruction cars, or, any effective methods to support them and further your accident prevention program.

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## Color Power in Industry

By GEORGE D. GAW
Director, Color Research Institute of America, Chicago

Although the words "red," "yellow," "blue," "green" have some generally understood meaning, they do not actually present specific values, because there are a great variety of red values and yellow values and blue values. At best, names—even of basic colors—are generalizations.

The psychological power of a color is predicated by its exact hue. The effect from a cold red (red and blue) is very different from that of a warm red (red and yellow). A green blue will not affect us the same way as will a purple blue.

Red is the most stimulating of colors. The love for red is universal. Children, primitive people, the cultured and sophisticated are all stimulated by red. Dislike for red is a psychological abnormality caused by some unpleasant childhood experience associated with that color. Red is not, however, good for people who are easily overstimulated.

Red is most beneficial for those who are in the habit of being morose or melancholy. A much greater number of people are being stimulated by red color than by intoxicating drinks, but since the color produces the stimulating psychological effect without going through the digestive system, we are not conscious of the stimulus.

A well-known business man had serious reverses. Financial losses had effected the man's mind, and he was taken to a psychopathic hospital. Having refused to touch food for many days, he was placed in a red room. In less than twenty-four hours in the room, the man called for food. His melancholy soon departed and he returned to normal life.

A famous football coach used color in fitting up his players' dressing rooms. For the room where they lounged and relaxed, he chose a soft, restful blue; but for the room where pep sessions took place, he employed red.

A well-known hostess was out of ideas for interesting parties, for which she was noted. A color specialist told her he could prescribe something that would assure her a *most* successful party, provided she promised *not* to serve alcoholic drinks the first two hours. The hostess reluctantly agreed. The color specialist instructed her to get magenta lights for every light fixture in the house and place a number of the lights under the furniture. She followed his instructions. Results: The party was a great success, although drinks were not served at all, and the hostess also reported that husbands were making love to their own wives and wives to their husbands.

The reason for the success was of course that the magenta (reddish purple) is stimulating and also flattering to the complexion. Perhaps a little magenta in the home can make a major contribution to family relations.

A noted woman journalist often is addicted to attacks of melancholia. When she feels the symptoms, she goes into a room



decorated and lighted with red. After spending some time in that room, she is ready to resume normal activity.

In addition to the psychological power, colors have other service value. Tomato picking became a problem, when experienced farm help flocked to the defense plants. Tomatoes must be picked when they reach a certain ripeness which is judged by the redness of the vegetable. The inexperienced pickers available could not judge the color and many unripe and overripe tomatoes were picked. This caused great losses. The matter was put before the agricultural department of Purdue University. Dr. Short prepared a paint of the color of the tomato as it should be for picking. The color was applied to the fingernails of the pickers, and all they had to do was to match the color on their fingernails with the tomato.

Yellow produces the sensation of sunlight, although actually daylight is cold because it reaches us through the blue heavens. The psychological reaction to yellow is not as positive as that of red or blue. The slightest changes in yellow will render it cold or warm, soothing or aggravating. This is a color that needs most careful handling, because the slightest change in the color value will alter its psychological character. A slight change in red does not alter its psychological power as much.

There are just as many case histories of the power of yellow as of red. Yellow has the best visibility and plays an important role in accident prevention in addition to being effective as a psychological force. Yellow and black are the most effective combination for visibility. Black and white stripes are still used for marking dangerous points. This, however, is not the most effective way of preventing accidents because white and black stripes have a tendency to blend in the eye and at a distance the space covered with the black and white stripes will appear grey. Whereas, yellow and black stripes will remain distinct at the same distance.

A building in a New Jersey community was painted a certain yellow. The residents asked the owner to change the color because it made them ill. He refused to make the change and the residents petitioned the City Council to force the owner to remove that sickening yellow, as a health measure.

There are numerous case histories of certain yellow colors causing vomiting. Yellow is particularly unpleasant in a fast-moving, swaying vehicle. An airplane painted yellow in the cabin caused indigestion and vomiting to the occupants. When the cabin was repainted a cool green, the digestive disorders were reduced more than 50 per cent.

Blue is the coldest of the colors. It is a psychological sedative for people who are disposed to being overstimulated. It is often depressing for the morose type of person. Those who are addicted with melancholic attacks should avoid blue and should surround themselves with red.

Of course, colors often produce physical reactions which are not easily traced to the color. Often a person will say: "This color makes me sick," or "I just love that color." But more often color power acts on the system without the person being aware of the presence of the color.

A cafeteria in a large industrial plant had warm neutral walls that were changed to blue in the annual cleaning. Dozens of complaints began coming into the office that the cafeteria was too cold. The plant engineer knew that the temperature in the room had not been changed.

A new coat of paint was applied to the walls. The blue was changed to orange. The chairs were also given orange covers. Complaints began coming in that the cafeteria was too hot. The engineer had not changed the temperature this time either. The orange chair covers were removed, but the walls remained orange. The temperature became satisfactory.

A visual sensation had produced a physical reaction. The diners saw blue and felt cold. They saw red and felt hot, although they were not aware that the change of color caused the sensations of cold and heat.

We speak of gay colors and somber colors. We have heard people declare that certain colors depress them and that other colors give them pleasure. We have gone to places that made us feel gloomy, and we have been in other places that inspired gaiety. More often than not the mood was caused by the colors in the room, but few persons were aware of that. Most of us are not conscious of the power that color has over us.



Whereas red produces cheer and alertness in normal people; to the abnormally excitable individual red is over-stimulating. Blue is calming for most people. But to the morose or depressed individual blue has a negative effect whereas red has a curative power.

An unhappy looking friend told a color specialist that his wife had the "blues," that she had hardly talked to him during the last six months and had been consistently morose. He asked the color specialist, who was a friend from schooldays, to visit his home. He thought perhaps a visit from an old friend would do some good to his unhappy wife. The much worried husband said he did not suggest going to a psychiatrist because he feared she would get to believe that she was insane and that would make matters worse.

The visit was uneventful. The young wife was pretty and morose, as her husband had said she was. She served tea mechanically and answered inquiries politely. Otherwise she did not utter a word. In answer to the question of how she liked her apartment, she replied that she hated it. This she said with emotion. It was the only emotional utterance she made the entire evening. At the close of the visit, the husband said that he appreciated his coming, but at the same time he betrayed disappointment. The visitor had failed to stimulate his wife. If anything, he seemed to have aggravated the situation with his constant questioning.

On the following day the color specialist called his old friend and emphatically advised him to have the apartment redecorated and to purchase a few small accessories for their home. The man, who knew the power of color, urged that the blue walls should at the first possible date be changed to a warm color with red in it—peach or a neutral orange. The black woodwork, he insisted, should be changed to white or ivory and a number of pictures, ceramics of some type, vases, pieces of sculpture, all predominantly in red or orange, should be added to the furnishings of the apartment.

At first the young wife was indifferent to the changes in the home, but in a few days she participated with enthusiasm in the arrangement of the new pieces and within a month she became a normal happy wife.

This case history is one of many such histories, and it is an emphatic demonstration of the psychological power of colors. The blue and black environment undoubtedly contributed to the psychic illness of the young woman, if it was not the sole cause. The introduction of the red environment undoubtedly produced the necessary stimulus for normalcy and happiness.

The following is a case where red had a negative effect. A young lady married a man who had a beautifully furnished apartment. She had visited his home on numerous occasions before they were married. In preparation for the new lady of the house, he had called in an interior decorator to redecorate the apartment. The blue walls were changed to orange and red was made to dominate the entire color scheme. He wanted to surprise her . . . and really did.

She had always been an overly excitable young lady and the hot color scheme did not help in controlling her temperamental outbursts. Her sudden and consistent erratic behaviour was attributed to many causes. However, a change of the color scheme in the apartment back to blue and other cool colors was followed by the return of a more rational character.

Perhaps there is a lesson in these case histories for other husbands with troublesome wives. The man, who contemplates changing his wife because she is melancholic or overly nervous, we advise that he change the color scheme in the home and keep his wife.

The last two cases demonstrate beyond doubt the tremendous psychological potentialities color has both as a constructive and destructive force. They show clearly that color is a major factor in the psychiatric field.

Colors do not have such violent effect on most normal people, merely because most normal persons do not react violently to any stimulus. But the case of the cafeteria, where the feeling of cold was brought about by blue and the sensation of heat by red on the walls, is an example of mass color power.

The tremendous increase in sales because of the use of color in advertising in all media is another proof of the universal psychological potency of color. Statistics show that a pink reply card or envelope will bring more returns than a card or envelope of any other color, because pink, being of



the red family, is energetic and inspires action.

Green produces the most normal reactions of all colors. In light, green is a primary color. In pigment, it is a mixture of yellow and blue. This color is associated with nature, growth, food. We are constantly surrounded by green and the color produces no extreme reaction. However, the color subconsciously is associated with nature and health and is pleasing and invigorating.

The Black Friar's Bridge in London became known as Suicide Bridge because many people took their lives there. The authorities decided to have the black bridge painted green. After that was done, suicides decreased more than half. Whereas the black color strengthened the desire to die the green called forth life, growth, nature, and often counteracted the morbid desire to die.

Orange belongs to the red family and is therefore warm and stimulating. Purple and violet belong to the blue family and are cold, distant, and sedative in character.

In daily living in the home, pure colors can be taken only in small doses. It would be overstimulating for normal people to live in a room of pure red and depressing to spend long periods of time in a blue room. For interior application on walls and other large areas therefore, colors are diluted with white. Pure colors are used only as accents on small objects or spaces.

The psychological reaction to color is very much like the physical reaction to drugs. Colors, like drugs, should be administered in the right doses. In color, as in drugs, there is the danger of overdosing as well as of weakening the application. The mixture of white with color is analagous to water dilution in internal medicine.

We are aware that the sun promotes health and growth, and we know that sunlight has through the ages been symbolic of life and that darkness meant death. Not very many years ago we learned that the sun also is the mother of color.

Color is light. Where there is no light, there is no color. White light is a mixture of all the colors. Black is the absence of colors.

When a surface reflects all colors equally, we see white. When a surface absorbs all colors equally, we see black. Most things in nature are neither pure black nor pure white, because they partially reflect and partially absorb color.

The color of an object is the reflected part of the light. When an object is red, it means that the surface of the object has absorbed the other colors from the light. Colors, like sounds, are transmitted through wave lengths.

Chemists are evolving hundreds of colors. They work with organic and inorganic materials and produce compounds that reflect and absorb light in various wave lengths.

Like air and water, we use color every day. We have it before us every waking moment. Color does mighty things to us but not very often are we aware of its subtle action.

We use color on the walls of our living quarters; we demand color in the furniture. We purchase colorful rugs, and we have paintings on our walls. Yet we rarely realize how much the color does for us or to us. Many people have distinct color preferences. Some choose blue as the favorite hue. Others prefer yellow. Many like green best, and most people like some shade of red. Generally, we go no further than personal preference in our pursuit of color. We usually take color for granted as we do air and water.

But scientists have been studying the power of color. Knowing that the sun promotes life, growth and heat, they sought to learn what colors—the components of sun light—promote? Surely if man's life is predicated by sunlight, colors—which are elements of sunlight—must have an effect on man's well being. Medical men have been studying the power of color and the Color Research Institute has been gathering the statistics available.

Case histories of color power are multitudinous. On the basis of scientific analysis and statistical data, we have learned the basic nature of each color. The primary colors are now easily analyzed. However, subtle mixtures present a more complicated problem.

The primary hues and secondaries, which are mixtures of two primaries, can be designated by a common word description such as red, blue, violet, orange. However, word designations become meaningless for colors that consist of more than two hues and black and white.



In pigment, yellow, red and blue are basic colors. This means that out of these three all other colors can be mixed. Green is derived by mixing yellow with blue; orange, yellow with red; violet, red with blue. Various shades are produced by adding black to the color and tints are created by adding white.

In light the problem is different. Yellow is not a primary color in light but green is. A warm red and a purplish blue are the two other primary colors in light. The primary colors of light are secondary mixtures in paint or ink.

Since light is the original source of color, the basic colors of light are the true primaries. We must mix two basic colors of pigment to get the basic colors of light. Yellow-green, orange-red, purple-blue are secondaries in pigment, that is, each is a mixture of two colors. Actually, these are the primary colors of light.

Color planning for modern industry embraces, in addition to the psychological factors, the symbolic values of colors and visibility aspects.

The symbolism that colors have for people is important. We have become conditioned to associate red with fire and danger, green with nature and safety. This conditioning has become part of the subconscious mind.

Confusing visibility with legibility is one of the common errors made in color usage today. In direct-mail advertising and in magazine ads, in all types of advertising where ink is used, legibility is the primary requirement. In machine shop, industrial plant, or on the highway—anywhere where paint is used for accident prevention—visibility is paramount. The principles of color combination for legibility differ radically from those of visibility.

A warm yellow next to black has highest visibility. Therefore, yellow and black are best where quick attention is essential and where reading at a distance is a factor. This is the most effective color combination for marking highways, for designating curbings and dead ends, and for marking hazards in plant interiors.

No color has as strong visibility power as yellow next to black. But a yellow and black stripe design should be used only for visibility purposes. It should never be employed where legibility is needed because this color combination is cutting to the eyes and will not hold sustained attention.

We use red to identify fire-fighting equipment, because red has long been established as a symbol for fire fighting. We can all identify the red fire-fighting trucks. However, through scientific experimentation with colors, it was found that red does not have the visibility power of a warm yellow.

In order to keep a man constantly impressed with the fact that he is using a dangerous machine, the Color Research Institute recommends that orange paint be applied to the machine. Orange consists of a mixture of yellow and red. It therefore has some of the high visibility of yellow and some of the danger symbolism of red. It is psychologically stimulating as well as subconsciously symbolic of danger.

Psychologically, red is highly stimulating; yellow is less stimulating; blue is cool and calming in character. In symbolic meaning, red stands for fire and danger; yellow is commonly associated with joy and sunshine; blue is often symbolic of respect and order. From the point of view of visibility, red has good visibility; yellow, strongest visibility; blue, weakest visibility.

A machine that has been treated with color is a more productive machine. By providing a distinct color difference between the working area of the machine, the material that is being processed, and the moving dangerous parts, all units are easily seen. The color difference provides constant warning to the machine operator of the dangerous moving parts.

The color creates increased visibility without glare, whereas a black surface does not reflect light and does not provide visibility, and white reflects maximum light but is blinding and irritating to the eyes. And there is also the psychological power of the color. Color on the machine and on the surrounding objects and walls is stimulating.

Because the lighting situation and type of structure, as well as the kind of work being done in the place, are major factors in color planning, plants must be given individual study. There are, however, some general color principles applied to all places of work.

Except in special cases, ceilings in plants are always painted white, this being the color reflecting the maximum light. White is not used on walls because the workers should be surrounded by colors that make them feel at ease and do not cause eye



fatigue. The color on the walls must be in keeping with the colors on the machines and should be in harmony with the function of the plant.

The old type industrial plant with its whitewashed interior is devoid of effective means of identification of danger, puts great strain on the eyes of the employees, causes general irritation and results in inefficiency, increased number of accidents, and lowers the workers' morale.

One interesting case history is of a plant where merchandise packed in black boxes was being loaded into cars. The workers showed fatigue in the early afternoon and were often reporting illness. A color specialist visited the plant and suggested that the boxes be painted a specified light green. After this was done, there were few complaints and absenteeism was cut down. Reason: black is depressing and heavy. Green is cheering and inspiring.

A plant that is scientifically "tuned in" with color is psychologically conducive to work and provides correct visibility and maximum safety. Everything in the plant, walls, ceiling, and machines are treated with colors that aid production.

A scientific application of color in the industrial plant results in more accurate and faster work, happier and less tired employees, a lower rate of accidents, and better labor relations.

Color inspires respect, encourages cleanliness, and promotes orderliness. Color is a universal language. People of all nations and of every race are affected by color because color sensation is instinctive.

We have seen the great power of color in selling. We have multitudinous case histories demonstrating the tremendous psychological power color has over people. When colors are used unscientifically they have little meaning and often produce harmful results. But color use that is planned, color that is harnessed for a purpose is of the greatest value to us.

Color tells us to go and color tells us to stop. Color causes eye strain, and color brings eye relief. Some colors say danger, others say safe. Color soothes or stimulates and color irritates or screams. Color is power.

We have learned to use the resources from the earth. We have harnessed water power. Now color is being harnessed for the benefit of man.

### Discussion

QUESTION: What is the easiest color on the eyes?

DR. GAW: I believe it is agreed that a certain value of green or blue-green is probably more comforting to the eye for long periods of time than any of the other colors. That is probably because green is a combination of blue and yellow, and is very mild, but just to tell you green, that isn't the full answer. In other words, you can't describe a color. You know what I mean; it's a light green tint.

The tints are easier on the eyes than the pure colors, and if you don't mind me adding a little additional answer, there seems to be quite a bit of confusion when we speak of colors in chroma and achromatic and all those darned things that get me *mixed up, but here is how simple* color termipology is: When you say *hue*, you merely mean a color that has neither white nor black content. That is a hue, or a pure color.

If you add white to that pure color, you get a *tint*. If you add black to that pure color, you get a *shade*. If you add both black and white, you get a *tone*, or, in other words, gray, the tones are colored down.

There are only four colors in the spectrum that have no resemblance to each other and they are red, yellow, blue and green. They are the colors that have the highest retention or memory, or identity qualities because all of the other colors are parts of those particular four.

QUESTION: Would you recommend that blue-green for offices and homes?

DR. GAW: Yes, sir; we find that it is difficult, as you perhaps know, to ever get one color that is going to be the preference of all people. Preference in color, sometimes is caused by the educational background or the physical condition, or perhaps the economic condition of people, but for blue-green and its complement which is in the peach family, we have never known of any people who disliked that color, which means that it is a safe color to use where many people are going to be.

Now, as individuals go, it is probably as nice a combination as you could ever hope for, because the blue-green has the sedative of the blue in it, and the cheering qualities of the yellow, but they won't zap you. In other words, you can relax in a blue-green environment without taking anything out of you.

QUESTION: Would "sea foam" be more of the answer?

DR. GAW: Mister, I'm going to tell you that I actually don't know what you mean by "sea foam." We have a directory of colors where there are over six thousand swatches. There are as many as one hundred different names for any given same swatch. These swatches were collected in all the English speaking nations from carpeting, linoleum, flooring, and paint shops, and so on, and I honestly don't know what *you mean by "sea foam,"* but I presume it is related to the green family, with a bit of white in it.

QUESTION: Yes.

DR. GAW: Well, I couldn't say. That sounds like it is a little cooling.

You know, you can make colors change the appearance of the size of a space; the cool colors mean colors with blue contained in them; the warm colors mean colors with red in them.

Now, the cool colors, optically go away from you; the warm colors optically come toward you. In other words, if we were in a room and you wanted those walls to appear further apart, if you paint those walls in a cool color, you would, due to an optical illusion, swear they were wider apart. If you put warm colors on, they'd pull that room together for you.

In other words, if the ends of a long narrow room are painted in a warm color and the sides of the wall in a cool color, it would balance that room up to the eye. It wouldn't change it in any way, except in the sensation that you would get from it.

QUESTION: Suppose you put a lantern down on the track, a lantern with a blue light, and walk back 200 feet; the blue disappears at the end of the 200 feet, and the flame burns yellow. What would you do in that circumstance?

DR. GAW: Did you say the blue-white would look yellow?

QUESTION: No, the blue disappeared entirely, and the flame would be yellow by walking back 200 feet away from it.



DR. GAW: Maybe it's the after-image. There are case histories in the Bureau of Navigation in Washington where there have been courts-martial for accidents on the high seas where green and red lights were used. The person got the after-image of a red light, we'll say, and looked at a sailboat coming and saw green where he thought it was red, and they didn't execute him.

CHAIRMAN ROBERTS: I might say, we use a corrugated globe, and it doesn't change.

QUESTION: I have been using or advocating the use of orange on all moving equipment in our shops and factories, is that correct?

DR. GAW: Yes, orange is one of your best colors. Orange is a combination of red and yellow, so the high visibility of the orange and the stimulation that comes from the red contact works on both the conscious and unconscious mind. In other words, experts have found orange to be better for that particular purpose than any of the other colors. They use yellow for caution signals at a distance, but where it is on a piece of moving equipment, I think you will find the combination of the visibility and the stimulative qualities. A room painted in orange will probably be, in sensation, the hottest room you can go in.

Football coaches Knute Rockne and Stagg both used red to pep up their team just before the game. They'd get them in a red room and let them have both barrels for a few minutes. But during the halves, they'd put them in a blue-green room to let them relax.

QUESTION: What would you recommend for the bumper on a truck, black and white striping, or black and yellow?

DR. GAW: The best combination for a bumper on a truck or any mobile vehicle is diagonal stripes of black and yellow. Nothing grows in nature ordinarily, except up and down. By crossing that diagonally we attract attention, and the vibration that yellow and black set up is the most powerful combination you can put together for that purpose. When you say yellow, it doesn't mean pure yellow, it means yellow with a little bit of red. Cool yellow doesn't have high visibility, but the warm yellow does have the maximum. Black with a blue content embellishes the color of the yellow, and, likewise, of the black.



# Non-Train Accidents

**(A Panel Discussion)**

*Discussion Leader:* R. P. HAMILTON, Superintendent of Safety, St. Louis-San Francisco Railway Co., St. Louis, Mo.

*Participants:*

E. J. BAYER, Principal Assistant Engineer, New York Central System, Cincinnati, Ohio.

W. V. MYERS, Superintendent of Motive Power, St. Louis-Southwestern Railway Co., Tyler, Tex.

H. B. PILCHER, Superintendent of Safety, Wabash Railroad Co., St. Louis, Mo.

O. F. RICHARDSON, Agent, Southern Railway System, Birmingham, Ala.

E. F. TUCK, Master Mechanic, St. Louis-San Francisco Railway Co. Springfield, Mo.

BERYL MCLAUGHLIN, Assistant Superintendent of Safety and Welfare, Duluth, Missabe and Iron Range Railway Co., Duluth, Minn.

CHAIRMAN HAMILTON: The latest yearly figures released by the Interstate Commerce Commission that I was able to obtain show there were 195 persons killed and 21,721 injured on railways of all classes in non-train accidents.

The classes of accidents, as listed by the Interstate Commerce Commission are as follows: employee on duty, (a) shop machinery, stationary engines and motors, cranes, etc.; (b) locomotive cranes, steam shovels, dredges, piledrivers; (c) transmission apparatus (belts, gears, shafting and ropes); (d) use of hand tools; (e) flying particles; (f) explosives and flammable, hot or corrosive substances; (g) electric current; (h) collapse, falls of objects; (i) handling rails, ties, bridge timbers; (j) maintenance of way and structures hand cars (non-train accidents only); (k) maintenance of way and structures motor cars (non-train accidents only); (l) handling freight or supplies; (m) falls of employees not includable in classes (a) to (l); (n) miscellaneous non-train accidents.

There were a total of 131 employees killed and 19,997 injured in non-train accidents during that year. Also 34 other persons were killed and 12,524 injured, making a grand total of 195 killed, and 21,721 injured.

In analyzing this report it is noted that the last three classes of accidents listed as items (l), (m) and (n) which are: handling freight or supplies, falls of employees, not includable in classes (a) to (l), and miscellaneous non-train accidents, resulted in approximately 40 per cent of the fatalities to employees, and 37 per cent of the injuries in non-train accidents to employees on duty.

## Non-Train Accidents in Maintenance of Way and Structure Department

MR. BAYER: In the maintenance of way department the prevention of motor car accidents is a subject for discussion which may never be permitted to grow old in the service. It is through constant and close supervision and dissemination of the facts developed in motor car accidents that we may ever hope to hold the accident ratio to a reasonable figure.

The motor cars are particularly susceptible to accidents. Not only do we have the human element involved, but we are also faced with the fact that we have a machine, a motor car, which, in itself, may contribute to accidents due to improper handling, use, maintenance and inspection.

Road crossings are a prolific source of accidents due to the introduction of the second human element, the driver of the automobile. Like situations occur with collision between trains, engines or cars and motor cars, or between two motor cars.

During a 14-year period from 1934 to 1947, we had, on the New York Central System, 441 motor car accidents resulting in the death of 37 employees and injury to 566. Of the 451 accidents, 111 were due to collisions. There were 60 with vehicles at public crossings, 26 with engines or cars, and 25 between two motor cars.

As a result of this experience, we have, within the past few years, revised our motor car rules covering public crossings, and are hopeful that they will be effective in reducing accidents due to that cause.

To combat the engine or car and motor car collision, we have just recently placed in effect a new code of rules for a portion of our road where we have sufficient telephone service, both wayside and portable. Here we require that permits be secured by the motor car operator from the signalman for the use of the main track, and his reporting in the clear when he has arrived at his destination.

This permission is entered upon a form, and provides protection for the motor car not only from trains but also from other motor cars. This gives positive protection from opposing movement and following movements. It is expected that as additional telephone equipment becomes available, additional mileage will be operated under these rules.

At the initiation of this protective measure it was felt it would, perhaps, result in delays to trains and motor car operation and an increase in non-productive time. As of this moment this apprehension has not materialized to the point where it has become a burden.

All motor car operators are, and have been, for a number of years, examined on track motor car and operating rules. Cars may be operated only by qualified operators. We believe that this provision has been the most important factor in our campaign for the prevention of motor car accidents.

Where the size of the gang is more than the car will comfortably carry, a trailer is provided. Our rules, however, specify that the trailer must be equipped with seats, safety rails, wheel guards and brakes to be so used. In our opinion the close policing of these rules has resulted in the prevention of many personal injuries.

Motor cars must be inspected daily, with particular attention being given to the treads and flanges of the wheels and no loose bolts in the train or running gear. Defective cars must not be operated.

On the New York Central System, since the beginning of the safety movement, we have always tried to provide a safe way of doing the job. These suggestions and hints usually appearing in the form of a bulletin and are discussed at all safety meetings.

In connection with motor cars, we have firmly held to the belief that practically all motor car accidents are preventable. So we rule out and do not accept excuses or alibis for carelessness.

All motor car accidents are carefully investigated by the supervisor, and in cases of a serious nature, by the division engineer or his assistant. The results are carefully considered by our safety department and become the basis of reports for bulletins to the system employees. Any program for the prevention of motor car accidents, to be successful, must be predicated upon the recognition of the seriousness of any accident, no matter how small, the determination of the acts leading up to and causing the accident, the education of the operators on safety practices, and, finally, a constant and close supervision which stems from the management. Any chain is only as strong as its weakest link. Don't be a weak link.

## Safety in the Mechanical Department

MR. MYERS: I want to say that safety, to me, is something that we live with, something we must understand, something we must experience.

All of you have an objective in mind; you are looking for some means to accomplish that objective.

I came up from the rank and file in the mechanical department. I speak to them in a manner in which they can appreciate because they believe that I have done the things they are doing.

I am very appreciative of the fine reception I have received because of the men's having confidence in me as their superintendent of motive power and the director of the mechanical department. They say, "He knows what he is talking about."

We are groping for a light ahead, for the entry to the intelligence of the individual who is working on the job. We want to see if there is a window in his soul we can look into and see how he is thinking.





I think from an academic standpoint that we have accomplished a great deal. The rules that we have available in our libraries, safety encyclopedias and records in the safety engineer's office are sufficient to guide the destiny of the mechanical department or any other department into a perfect operation, free from personal injury.

But what is wrong? I think every mechanical officer should instill into the rank and file down to the last and least supervisors just what it takes to get over to his working personnel the necessary information to make them safety minded.

That is what we are after. I feel a deep sense of interest in everybody because we are all human beings. We have homes, wives, children and friends, so why should not we, as mechanical officers, make the necessary effort to indoctrinate and instill in the working personnel, through our supervisors, the necessary information to make them safety minded.

Let us not have too great a distance between the academic and the practical. You know what the boss had to say to make you understand, and you know what he said that you didn't appreciate. Remember this when talking to the men.

All of us are individuals, and in the studies of human relations and psychology of handling of men, the wise supervisor must realize and understand what is before him in understanding the different personalities of his various employees.

I think the outstanding things for any mechanical department supervisor to understand are the factors that he has employed in the handling of the particular job or unit of operation. The thing I want to emphasize today is that we must create an atmosphere receptive to safety information. Men are men wherever you go and wherever you find them. They have a window in their soul you can look at and a chord you may play on which will respond to your instructions, favorable or unfavorable.

I was very much gratified a few months ago after I had spent some time in making an extensive campaign over our line to talk to the employees. I called every supervisor away from his work and talked for 15 or 20 minutes to him or the men under his jurisdiction.

One of the mechanics who had heard me talk said to me sometime later, "Mr. Myers, what I appreciated most in your talk was your stating the purpose of safety, who gets the benefits out of safety, and why the railroad is behind safety."

I tried in this discussion to say what the objective of safety was and who was the beneficiary. First, that no man or woman wanted to get hurt. Second, that no employer wanted any employee injured or hurt. The objective of management is safety for the purpose of benefitting the employee, lifting the morale of the railroad and creating a better environment in which to work.

We must recognize that the greatest asset in the mechanical department is the employees. We must cultivate their morale and keep them safe.

I want to outline briefly how a mechanical department can operate efficiently and safely: First, the management must provide a definite safety policy. That safety policy must be publicized and made known through the various administrative officers down to the supervisor of the working personnel.

In my department, the superintendent of motor power must dispense any necessary information to the master mechanics and general foremen to help them in the administration of the safety program.

Next, careful selection of supervisors must be made. First, a supervisor must be selected for his ability to perform the work that he is to supervise.

Second, the qualification of supervisor must be that he is able to dispense to the worker the necessary information as to how to perform the job properly and safely, combining production and safety.

The administration of work in the shops or engine houses must be carefully supervised by the general foreman; that is, he must be able to line up the work units for the various departmental foremen. Second, the general foreman must understand and be able to judge the efficiency as well as the safety consciousness of any supervisor.



When we have a system like that, and all supervisors have the ability to dispense the information (many of them have the ability to perform the work, but it is quite different to do the work yourself and tell the other fellow how)—when we have such a system the superintendent or master mechanic should go over the railroad and visit as many points as possible. Let the working personnel realize that safety has the support and interest of management. I think that the greatest asset is that the men know that what their supervisor has been telling them has the support of everybody from his rank up. It won't hurt anybody to bend his back. Speak to John, Bill or Harry, and let him know you are interested in him.

### The Safety Man's Idea on What Should Be Done to Have an Effective Safety Program on the Railroad

MR. PILCHER: When Mr. Hamilton assigned me the subject of "The safety man's idea of what should be done to have an effective safety program on the railroads," I thought of many Utopian ideas that have been hatching in the brains of railroad safety men for years—such as unlimited amounts of money to spend, large forces of capable safety inspectors, a great big place in the sun for the safety department and many other such things, but we have to be practical in order to survive in this difficult business of railroading. Consequently I have confined my ideas to things that are in the reach of all of us.

There are no outstanding innovations in railroad safety. Through a period of years we have experienced probably every kind of accident that will occur for many years to come. Factually our accidents are now and have been for a long time occurring from a continual repetition of the same causes. To have an effective safety program it seems to me to be a case of intelligently taking advantage of what we already know and effectively administering preventive measures on the basis of our past experience.

For these reasons it seems to me there are several fundamental ideas which are essential to produce an effective safety program on the railroads. These are given to you, not necessarily in the order of importance.

1. *The whole-hearted, liberal, enthusiastic sincere support of the safety program by the top executive as well as all other executives in every department.* Thank goodness nearly all of us have this type of support. The old resentment of safety died out many years ago. Whether the safety department should report directly to the chief executive or to the head of the operating department is a matter of choice. The program can be made effective either way—therefore it resolves itself into a matter of policy for the individual railroad.

2. *Effective Supervision—the man directly in charge of the work and responsible for the actions of the workers is the prime factor in a successful safety program.* Too often supervisors are chosen for their ability to produce only. In order for a supervisor to properly take his place in an effective safety program his individual safety knowledge, attitude and ability should be given as much credence as his efficiency, technical ability, honesty or integrity. After all, efficiency without safety is dangerous and inhuman. Naturally it is assumed that an effective supervisor must be able to handle men in a manner to create confidence and instill a favorable morale in the individual.

3. *A safety department headed by experienced and capable personnel, sufficient force to administer the program with intelligence.* Safety inspectors or agents must be vitally interested in their duties and enthusiastic in their actions. They should be selected on the basis of their experience. For instance an inspector assigned to contact shop employees and inspect shop facilities should be an experienced shop man. These men should be able to demonstrate and do the job by experience and talk the language of the people whom they are contacting. Railroad employees in this day and age know whether a man "knows his stuff" or not. A wrong answer to a vital question on the safe way to do a job will lower the safety morale of the worker quicker than nearly any other thing.

4. *Rigid pre-employment requirements as to intelligence, fitness and physical condition are vitally important and too often*



*overlooked*. It is amazing how often physical defects are missed by the examining doctor. I know of a case where a young veteran was hired, a *big* strapping fellow, for a job as a brakeman. After he had completed his student trip satisfactorily he went to work for pay. On his third pay trip he fell down on perfectly level ground and injured his hand. When he was hospitalized they discovered he had a collapsed lung and three toes off one foot, *which in* all probability accounted for his fall. Possibly the scarcity of labor during the war period is still having its effect but careful, thorough pre-employment examinations are a "must." Regardless of cost a thorough examination should be made. It is better to undress him before he goes to work than to take off his clothes to set a broken bone.

5. *An educational program should not be a by-product of safety, but should be the No. 1 requirement.* Many factors go to provide education for the railroad worker such as instruction schools, safety meetings, posters, placards, publications, data sheets, reports of all nature, slide films, motion pictures, charts and other such items. Some are enthusiastic about all or a portion of them but we must be careful not to overdo it lest the employee *might* term them propaganda which immediately brings to mind the secret or clandestine dissemination of lies or gossip. Fortunately there is no occasion for untruths or a retouching of the railroad picture. Our business is based on sound factors open to public and governmental investigation, the truth must be and is at all times adhered to. Safety education should not be confined to the safety rules alone but should include all rules, operating, maintenance, mechanical and so on. Actually every railroad rule has safety for its foundation. This matter of rules education is a most serious one. it must never be an "I guess so" proposition, but always a definite "yes" or "no." It goes without saying that men should be effectively educated on the rules by intelligent *instructors*. They should be instructed on the proper interpretations of the rules and advised why the rules exist and what results may occur if violations are indulged in. The old employee as well as the new man, no matter what his background, should never be taken for granted but a tolerant process of education should be offered him so that he may know his obligation to himself, his family, the public and his employer.

6. *Rule compliance is a very essential factor in any effective safety program.* Once the rules are in effect they must first be completely understood by all supervisors whether safety or otherwise. There are two theories with regard to safety rule compliance; the one *in which the management* feels that the safety rules are so simple and of such importance to his physical well-being that the employee can and should be sold on voluntary compliance. The other, the *prohibition* theory where strict discipline is assessed for violations. Certainly in the first theory the flagrant violator must be disciplined. Strict safety rule compliance is essential to be secured in whatever way is best fitted to the particular railroad, but first all of us must be absolutely sure that the *individual's* education has been adequate and that the rules are based on good common sense and *judgment*.

7. *Preventive Maintenance—We are daily getting to a point on the railroads where we are coming close to mechanical or physical perfection as pertains to safety.* In recent years the bulk of the unsafe conditions have been due to deferred maintenance. There again enters the education of the supervisory staff. *Many times* personal injuries have occurred because a ballast gant has surfaced through a switch and left the footing bad for the trainman to step off and fall in the dark of the night. This type of work comes under the head of deferred maintenance. A condition which might cause an accident should never be deferred even over night when it can be avoided. Supervisors should be as thoroughly alert to correct unsafe conditions as they are to detect unsafe practices.

8. *Investigations—After accidents occur an intelligent, thoroughly honest and impartial investigation should be made to determine the actual cause of accidents whether they be of a minor or serious nature.* Our efforts should not be confined merely to reportable accidents, often the so-called minor accident or "near miss" has more serious potentialities than those which result in a reportable injury. We are quite *often prone to blame* accidents on the new fellow who gets injured rather than to place the responsibility on lack of supervision or education. Such reports must leak into every safety department that actually dodge the issue. For example the report of an injured track laborer will show that he slipped while pulling a tie into a crib rather than giving the fact that the tie tong was dull and defective. Only by completely and honestly determining all the factors involved in the causes of accidents can we intelligently and effectively take corrective action to prevent a recurrence.

9. *Prevention of malingering—after accidents have occurred there should be sufficient force and interest on the part of those responsible to follow up on all accidents to prevent malingering.* Malingering is a human nature factor, but thank goodness those people who habitually try to put their head in your pocket constitute a very small percentage of the total. But so long as there are a few of them around safeguards must be in effect to prevent a repetition.

### Agents Responsibility in the Promotion of Safety

MR. RICHARDSON: In ancient Rome it was believed that bad luck was brought to a house by a person who crossed the threshold with his *left* foot. This belief was so strong that oftentimes a boy was stationed at the door to make sure all visitors entered the house right foot forward. This superstition eventually died out but it left us with the saying of "putting our best foot forward."

We can't do as the Romans did and have a boy at hand constantly to see that every person with whom we are connected puts his best foot forward, or in our case, that everyone performs his daily tasks in exactly the safest manner, and that is where responsibility as agent descends upon us. Since we can't do as the Romans did, it becomes necessary that we arrange and devise other safeguards to throw around the men under our supervision that will cause them to think and act at all times under safe conditions. To accomplish this I offer a few suggestions.

1. Whether we will it or not we must be a part of the safety program of our company, town, state and nation, so we might as well accept the responsibility and make it a very personal matter, *and let our men know that we are really interested in their welfare from their standpoint and not just talking safety.*



2. It is left to the agent to stimulate and pursue at all times a genuine interest in the safety movement, continually cautioning and observing the men as the chance permits, and ever alert to detect any faulty equipment with which the work must be performed.

3. We must at all times be mindful of the fact that no more interest in safety will be shown around our platforms and warehouses than is manifested by us.

4. Make our safety meetings of interest and in such manner and language as the men we are trying to reach will understand. Allowing the men themselves to take part therein, and we are sometimes surprised at what they may tell us.

5. Use every means at hand to reach them. In my case I have a public address system extending over my entire space and this is used to great advantage.

6. Stress the use of safety shoes all possible. When making your rounds stop and solicit them personally, assuring them always that it is for their benefit and that the company is not profiting financially from the sale of the shoes.

Unfortunately we, like the old Romans, oftentimes appear as yet, to believe in what we term luck; be it good or bad and if things go right then our luck is with us, if not then we just had a bad-luck streak. Or is it that we believe that we are just bound to have accidents and that apparently so many are assigned to our platform and they are going to happen regardless of what we do? If we hold such beliefs we are defeated in the beginning. Not so many years ago small pox and typhoid were two of our worst killers. Today seldom do we hear of either. Why? Because a few folks decided that this did not need to happen and proved it by practically stamping it out. As it was with these two killers, we too must be ever on the alert in our effort to stamp out the alarming accident rate, and at the same time devise ways and means to sell or put it over.

### Cooperation Between Supervisors and Shop Safety Committee

MR. TUCK: Cooperation between the supervision and shop safety committee is of paramount importance. If it doesn't



exist, the efforts of the committee will be futile. Considering this, the responsibility of the supervisor cannot be overstressed. The supervisor, first, must be safety conscious and fully cognizant of his responsibility in reducing and preventing personal injuries.

Extreme care should be observed in the selection of safety committeemen, the same manner and care that we take in selecting a supervisor. It is my thought that members of the committee should be changed from time to time, allowing some to serve longer than others in order to keep experienced men at all times on our committees.

The supervisor should take the responsibility of training and educating the members of his safety committee. He should realize that he cannot expect them to be more interested or observant than he is. He should frequently express his appreciation for the assistance he receives from the committee. If he does what he can, and should to keep them interested, they will be more observant and of greater benefit to him. It cannot be expected that the committee will entirely do the job.

All suggestions made by members of the committee should be seriously considered. A large per cent of the suggestions, of course, will not be practical. But, an effort should be made to go along with them as much as possible, encouraging them to offer suggestions. If they are not given due consideration in this respect and the conditions which they report corrected promptly, they will lose interest and feel that they are merely put on so that the foreman's conscience will be eased to the extent that he can tell his superiors he has a safety committee.

A supervisor cannot be relieved of any responsibility in connection with accident prevention, correction of bad practices and bad conditions in his shops. Accidents occurring, regardless of how minor, should be thoroughly investigated and, if possible, the cause determined, then necessary steps taken to eliminate the hazard or condition which contributed to the accident.

Unnecessary loss of time from the job can be prevented by close cooperation between the supervisor and the medical staff. Instill in the men the desire to come back to work. This can be done by the proper approach of the representative foreman or general foreman. We have very few men in our employ today who willfully overstay the length of their disability, but we do have some few. It is up to the foreman to know who these men are and put the proper amount of pressure on them to return to work.

The foreman's committee will largely be what he makes it. Ninety-five per cent of the personal injuries we have are due to thoughtlessness or carelessness, or unsafe practices. Very small percentage are due to hazardous conditions.

We will not eliminate personal injuries among our employees until we get every man safety conscious, and as long as the foreman is too busy to devote any personal time to the education of his committeemen and employees, we can't expect a great deal of improvement.

Let us remember that one thought for safety is worth a thousand regrets!

(MR. BERYL McLAUGHLIN presented a short talk on "The Value of Safety Rules.")

CHAIRMAN HAMILTON: Are there any questions?

QUESTION: Is any special consideration given to the men that are selected to serve as committeemen? I bring that up for this reason: On our road we do give special consideration to members of the fire committee, such as certain kinds of an annual pass.

CHAIRMAN HAMILTON: On the Frisco Line, we have inaugurated the following system: Any time that any shop, division point, terminal, goes 60 days without a reportable injury, the safety committee is given a banquet. We recently had three dinners at one shop, and in one of the large shops had five dinners lined up within the next week.

MR. MYERS: I think herein lies one of the most essential factors of the promotion of safety. A safety committeeman should be a man that thoroughly understands his department. If he is a careful worker, his record will stand for that, and his work must also serve as an example to the other men. A safety record which has achieved results certainly ought to be recognized.



# A Brief History of the Railroad Section National Safety Council

The "First Cooperative Safety Congress, held under the auspices of the Association of Iron and Steel Electrical Engineers," took place at Milwaukee, Wisconsin, September 30 to October 5, 1912. A resolution was adopted at this Congress directing that steps be taken toward the formation of a national organization for the promotion of safety to human life by appointing a committee on permanent organization.

The Organization Committee appointed as directed in the resolution included, among others, Commissioner Charles C. McChord, of the Interstate Commerce Commission; L. R. Palmer of the Association of Iron and Steel Electrical Engineers, who for 33 years thereafter was closely associated with the safety movement on the American railroads; and R. C. Richards, Chairman, Central Safety Committee, Chicago and North Western Railroad, who was afterward referred to as the father of the American railroad safety movement.

Mr. Richards presided over a Transportation Session held at the 1912 Congress.

At the 1913 Congress there was a "Divisional Session," at which Mr. Richards spoke on "Safety in Transportation." At the 1914 Congress there was a Transportation and Public Service Session.

At the 1915 Congress there was a Railroad Sectional Meeting, presided over by Marcus A. Dow of the New York Central Lines, New York City.

In 1915 the Steam Railroad Section was organized, and Mr. Dow was elected as General Chairman of the Section for the year 1915-16.

During the 1915 Congress a committee of the Railroad Section was appointed which drafted a set of by-laws for the Section. The by-laws provided that the officers should be a Chairman, Vice-Chairman, and Secretary. Nominations were to be made by a Nominating Committee of three appointed by the Chairman of the Section, which was to select a slate of officers, to be followed at the same meeting by the election of officers. Other nominations were permitted from the floor. The members of the Section were to meet annually during the Congress. Other meetings of members could be held on due call and order by the Sectional Executive Committee. The Executive Committee of the Section was to be composed of the Chairman, Vice-Chairman and Secretary of the Section, and the Secretary of the National Safety Council as an ex-officio member, plus the Chairmen of the following four standing committees: (1) Membership Committee, (2) Standardization Committee, (3) Committee to Study Causes and Remedies of Hazards in the Section's Field of Activity, and (4) Program Committee.

The preparation of "bulletins" (posters) for the Railroad Section was begun in 1916, and the first Steam Railroad Section News Letter appeared in 1917. It is interesting to note that at the 1917 Congress the Steam Railroad Section Secretary remarked that in spite of pleas to the membership, he had had to do practically all the work of getting out the News Letters himself—that he had had only one contribution. News Letter Editors of this day are still having the same trouble.

The activities of the Steam Railroad Section were greatly stimulated by the entry of the United States into the first World War, and by the very active support of the United States Railroad Administration.

The first Annual Green Book appeared in 1923. It was a reprint of an address by Lew R. Palmer entitled "The National Cost of Railroad Accidents," delivered by Mr. Palmer before the Steam Railroad Section at the 12th Annual National Safety Congress in Buffalo.

The fifth Annual Green Book appeared in 1928, and contained the report of the 1st Annual Award in the Railroad Employees' National Safety Contest. 1948 marked the 25th Annual Green Book and the 21st award in the contest.

In 1924 the railroads adopted a resolution setting up a goal of reducing railroad accident casualties 25 per cent by the end of 1930, using the 1923 casualty rate as a basis of comparison. This goal was surpassed far ahead of schedule, and a new series of goals was adopted, culminating in the ultimate ob-



jective of a 75 per cent reduction by 1933. This final goal was surpassed by 1931. At no time since has the casualty rate for any year, even during World War II, exceeded 40 per cent of the 1923 rate.

With the coming of the depression in 1929, the suggestion was made that the Steam Railroad Section and the Safety Section of the American Railway Association combine their meetings, since it was felt that economic conditions made it undesirable to hold two railroad safety conventions each year. The arrangement was finally consummated in 1931, at which time the two organizations consolidated under the name "Safety Section, American Railway Association — Steam Railroad Section, National Safety Council." The consolidated organization for several years held one annual series of sessions at the National Safety Congress. For five years, beginning with 1931-32, officers were elected for the consolidated organization.

The consolidation was consummated symbolically at the 1932 National Safety Congress by a "joining hands" ceremony, participated in by Mr. Warfel, the previous Chairman of the separate Steam Railroad Section, and Mr. Bailey, the first Chairman of the consolidated organization.

In the middle of the decade, the consolidation was dissolved, since the economic necessity no longer existed. The Steam Railroad Section continued to hold annual sessions at the National Safety Congress. In 1936, 1937, and 1938, W. W. Wood, Superintendent of Safety and Welfare of the Baltimore and Ohio Railroad Company, served as Chairman. In 1938 the Section was formally reorganized, and E. L. Henry, Superintendent of Safety of the Chicago and North Western Railway Company, was elected General Chairman for the year 1939-40, along with a complete slate of officers and committee chairmen. Mr. Henry presided at the sessions at the 1939 Congress.

Thus, through the untiring effort and the loyal support of its members, the Railroad Section has preserved its continuity since the very day when the railroads took an active part in the organization of the National Safety Council. Since the first sectional sessions were held in 1915, there have been Railroad Section sessions at every one of the National Safety Congresses.

When World War II came, organized safety on the railroads was working so effectively that the highest employee casualty rate reached by the American railroads during the war years was 60 per cent less than the 1923 rate.

During the war the efforts of the Steam Railroad Section were greatly enhanced by the active encouragement of safety activities of the United States Government, and by the War Fund to Conserve Manpower. Aided by money from this fund, the Steam Railroad Section produced safety films and a great deal of other educational material.

Toward the close of the second World War, a great nation-wide program for the reduction of highway-rail grade crossing and trespassing accidents was launched with the blessing of the Grade Crossing and Trespassing Committees of the Steam Railroad Section and the Safety Section, Association of American Railroads. This well-integrated program is now functioning smoothly and all the vast publicity resources of the National Safety Council through the media of press and radio are being utilized to educate the motoring public in the observance of grade crossing signs and signals in the same manner as it is being educated to observe all other traffic signs and signals.

During the 34 years of its existence, the Railroad Section has produced hundreds of posters, a series of sound slidefilms, and many other materials for safety education for the benefit of the railroad industry. The latest achievement has been the launching of the SAFE RAILROADER, a bimonthly magazine intended for distribution to railroad employees. This publication first appeared in June, 1948, and its circulation from the start has been in excess of 100,000 copies per issue.

The Section has kept abreast of the times. It has never failed to avail itself of the latest ideas in safety education. In keeping with its forward-looking character, the Executive Committee of the Steam Railroad Section of the National Safety Council on June 11, 1947, changed the name of the Section by eliminating from it the word "Steam." This was done for obvious reasons. The official name of the Section since that date has been Railroad Section.

It is a great heritage which the pioneers of the Railroad Section have left us: a whole new generation of railroad employees who are, to a greater or lesser degree, safety minded. Throughout the entire railroad career of most of today's railroad employees, they have been constantly exposed to safety education on every hand. However thoughtless or antagonistic any of them may be, there is not one but has absorbed some of its influence.

Times will change, and techniques with them, but the fundamental principles of safety education remain. We can still learn much from the wisdom of Ralph Richards and Lew Palmer and Marcus Dow. And by the enthusiastic and untiring application of the principles which they set forth long ago, we can go on to accomplish in the future greater things than these pioneers ever dreamed of. And the Railroad Section, if we so will it, can always be a powerful force in this cause.



## ⁰ist General Chairmen, Railroad Section National Safety Council

1915-16 MARCUS A. DOW, New York Central Lines

1916-17 W. C. WILSON, The Delaware, Lackawanna and Western Railroad Co.; retired during year, succeeded by:

ISAIAH HALE, Atchison, Topeka and Santa Fe Railroad

Mr. Hale was unable to be present at the 1917 Congress, at which the Railroad Sessions were presided over by:

H. J. BELL, Chicago and North Western Railway Company

1917-18 H. J. BELL, Regional Supervisor of Safety, United States Railroad Administration

1918-19 R. C. RICHARDS, Chicago and North Western Railway Company

1919-20 FRED MEYERS, Wabash Railroad Company; resigned during year, and Railroad Sessions at the 1920 Congress were presided over by:

ROBERT SCOTT, Atlantic Coast Line Railroad

1920-21 THOMAS H. CARROW, Pennsylvania System

1921-22 ISAIAH HALE, Atchison, Topeka and Santa Fe Railroad Company

1922-23 L. G. BENTLEY, Chesapeake and Ohio Railroad Company

1923-24 FRED M. METCALFE, Northern Pacific Railway Company

1924-25 CHARLES E. HILL, New York Central Lines

1925-26 A. V. ROSWEIDE, Duluth, Missabe and Northern Railway and Duluth and Iron Range Railroad

1926-27 J. D. WHITE, Illinois Central Railroad Company

1927-28 E. R. COTT, The Hocking Valley Railway Company

1928-29 J. E. LONG, The Delaware and Hudson Company

1929-30 C. F. LARSON, Missouri Pacific Railroad Company

1930-31 GEORGE H. WARFEL, Union Pacific System

1931-32 C. T. BAILEY, Oregon Short Line Railroad*

1932-33 CHARLES E. HILL, New York Central Lines*

1933-34 C. L. LAFOUNTAINE, Great Northern Railway Company*

1934-35 THOMAS H. CARROW, The Pennsylvania Railroad*

1935-36 C. F. LARSON, Missouri Pacific Lines*

1936-37 W. W. WOOD, The Baltimore and Ohio Railroad Company**

1937-38 W. W. WOOD, The Baltimore and Ohio Railroad Company**

1938-39 W. W. WOOD, The Baltimore and Ohio Railroad Company**

1939-40 E. L. HENRY, Chicago and North Western Railway Company

1940-41 J. R. TENNEY, Western Maryland Railway Company

1941-42 O. F. GRABINGER, Elgin, Joliet and Eastern Railway Company

1942-43 F. A. BOGUE, Chicago, Rock Island and Pacific Railway Company



1943-44 H. A. Daake, Erie Railroad Company

1944-45 G. W. Elste, The Baltimore and Ohio Railroad Company

1945-46 G. W. Elste, The Baltimore and Ohio Railroad Company

Mr. Elste was unable to be present at the 1946 Congress, at which the Railroad Sessions were presided over by:

L. E. Hoffman, St. Louis Southwestern Railway Lines

1946-47 C. M. Bowling, The Louisville & Nashville Railroad Company

1947-48 W. H. Roberts, The Chicago and Northwestern System

*Chairman of Consolidated Safety Section, American Railway Association—Steam Railroad Section, National Safety Council

**Presided at Steam Railroad Section meetings at National Safety Congresses.

The following served as President of the National Safety Council:

1916-17 Lew R. Palmer

1919-20 Ralph C. Richards, Chicago and North Western Railway Company

1922-23 Marcus A. Dow, New York Central Lines

1933-35 John E. Long, The Delaware & Hudson Railroad Corporation



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*Vice Chairman*—R. P. HAMILTON, St. Louis-San Francisco Railway Company, St. Louis, Mo.

*Secretary and News Letter Editor*—J. R. THEXTON, The Delaware, Lackawanna and Western Railroad Company, Hoboken, N. J.

*Contest Committee*—*C. L. LaFOUNTAINE (Chairman), The Great Northern Railway Company, St. Paul, Minn.; *J. E. LONG (Vice-Chairman), The Delaware and Hudson Railroad Corporation, Albany, N. Y.; L. E. HOFFMAN, St. Louis-Southwestern Railway Lines, Tyler, Tex.

*Health Committee*—DR. GEORGE P. MYERS (Chairman), New York Central System (Retired), Grosse Pointe Park, Mich.

*Highway-Railroad Crossing Committee*—C. E. KIMBALL (Chairman), Southern Railway System, Washington, D. C.; *J. R. TENNEY (Vice-Chairman), Western Maryland Railway Company, Hagerstown, Md.; L. J. BENSON, Chicago, Milwaukee, St. Paul and Pacific Railroad, Chicago, Ill.; *C. M. BOWLING, Louisville and Nashville Railroad, Louisville, Ky.; A. E. DAVIS, Chicago, Burlington and Quincy Railroad, Chicago, Ill.; E. L. DUGGAN, The Atchison, Topeka and Santa Fe Railway Company, Chicago, Ill.; *G. W. ELSTE, Baltimore and Ohio Railroad, Baltimore and Ohio Building, Baltimore, Md.; *O. F. GNADINGER, Elgin, Joliet and Eastern Railway Company, Joliet, Ill.; *W. H. ROBERTS, Chicago and North Western Railway System, Chicago, Ill.; J. P. WADSWORTH, Canadian National Railways, West, Montreal, Quebec; C. R. YOUNG, Illinois Central Railroad, Chicago, Ill.

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*Statistics Committee*—*T. H. CARROW (Chairman), The Pennsylvania Railroad, Philadelphia, Pa.; *O. F. GNADINGER (Vice-Chairman), Elgin, Joliet and Eastern Railway Company, Joliet, Ill.; J. W. THOMPSON, Seaboard Airline Railroad Company, Norfolk, Va.

*Trespassing Committee*—*J. R. TENNEY (Chairman), Western Maryland Railway Company, Hagerstown, Md.; R. C. SABENS (Vice-Chairman), The New York, Chicago and St. Louis Railroad Company, Cleveland, Ohio; S. D. COULTON, Wheeling and Lake Erie Railway Company, Cleveland, Ohio; J. F. COREY, Erie Railroad Company, Cleveland, Ohio; R. F. REANY, Lehigh Valley Railroad, New York, N. Y.



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*Safetygraph Committee*—J. A. CLANCY (Chairman), New York, New Haven and Hartford Railroad Company, New Haven, Conn.; F. R. BRADFORD, Boston and Maine Railroad, Boston, Mass.; C. E. BELL, Reading Company, Reading, Pa.

*Poster Committee*—G. M. DEMPSEY (Chairman), Chicago, Milwaukee, St. Paul and Pacific Railroad Company, Chicago, Ill.; C. T. DeWITT, Northern Pacific Railway Company, St. Paul, Minn.; C. R. DIAMOND, Kansas City Southern Railway Company, Shreveport, La.

*Safe Practices Pamphlets Committee*—F. B. LEWIS (Chairman), Union Pacific Railroad Company, Omaha, Nebr.; J. P. WADSWORTH (Vice-Chairman), Canadian National Railways, Montreal, Quebec; H. B. PILCHER, Wabash Railway Company, St. Louis, Mo.; O. H. BRYAN, Western Pacific Railroad Company, San Francisco, Calif.

*Safety Devices Committee*—D. W. NAFF (Chairman), Norfolk and Western Railway Company, Roanoke, Va.; E. E. SEYFARTH, Belt Railway Company of Chicago, Chicago, Ill.; G. A. ROBINSON, The Chesapeake and Ohio Railway Company, Richmond, Va.; C. W. DOWDY, The Virginian Railway Company, Roanoke, Va.

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*Staff Representative*—L. W. DUTTON, National Safety Council, Chicago, Illinois.

*Past General Chairman.





# OTHER VOLUMES

## *in this Series*

Many users of this volume will also find much value in its companion volumes. Here is the list:

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*Current Safety Topics in the*

# RUBBER INDUSTRY

**As presented in the Rubber Sessions of the 1948 National Safety Congress**

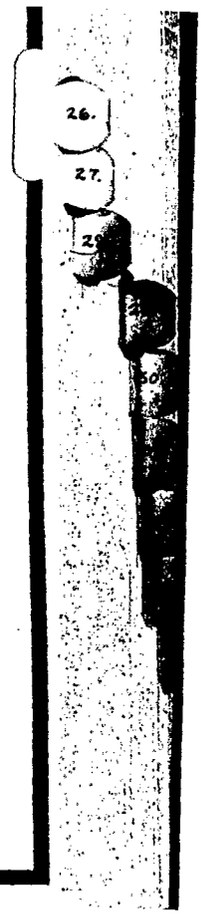
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**Volume 26**
**Transactions**
**1948 National Safety Congress**

COUNCIL



# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original *manuscripts, with any charts or illustrations which were used,* are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE RUBBER SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Rubber Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Rubber Section carries on in behalf of its members, and for the benefit of accident prevention work in the rubber industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of rubber plants. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on page 15 of this volume.



## Recent Developments in Industrial Accident Reporting and Injury Rate Calculations

*Discussion Leader:* HENRY G. LAMB, Safety Engineer, American Standards Association, New York City.

*Participants:*

THOMAS J. CAIN, JR., Safety Engineer, The B. F. Goodrich Co., Akron, Ohio.

ROLAND KASTELL, Assistant to Supervisor of Safety, U. S. Rubber Co., New York City.

GORDON TRANK, Safety Engineer, Hewitt Robbins, Inc., Buffalo, N. Y.

CHAIRMAN LAMB: The National Safety Council has taken a real leadership in developing the American Standard Method of Compiling Industrial Injury Rates, Z16.1-1945. This document has been the basis for the industrial injury rates shown in *Accident Facts,* published annually by the National Safety Council and of the injury rates published by the Bureau of Labor Statistics. The National Safety Council, Safe Practice Pamphlet No. 21 on Computing Injury Rates is technically consistent with the American Standard and either may be used to obtain the same results.

At the time of the 1945 revision, it was realized that certain cases might arise, which had not been clearly covered by the standard. In order to provide for this, a Committee of Judges was established, to render decisions on doubtful cases. In 1947 this Committee of Judges made a compilation of the first 20 cases upon which decisions had been reached. A compilation of a second batch of 20 decisions was made on June 2, 1948. Announcements of the availability of these 40 decisions have appeared in most of the safety publications, and the American Standards Association has received a very large demand for copies from all over the country. Almost every section of the standard has been the subject of one or more questions presented to the Committee of Judges. As you would probably imagine, about one-third of these questions have been on whether or not a particular injury arose out of and in the course of employment. Some have been very much on the borderline, and the Committee of Judges has devoted much time, both in correspondence and in debate at meetings, to this type of question.

Some cases have indicated a lack of clarity in the wording of the present standard. These have all been noted for consideration in any revision of the standard.

At a meeting of the sectional committee Z16 on November 12 and 13 of last year a subcommittee was appointed to consider possible revision or clarification of the present standard. To expedite this work, four subcommittees are now actively studying the various parts of the code, as follows:

1. Introduction and Section 2—Scope of the Code.
2. Sections 3 and 4—Classification and Time Charges.
3. Sections 1, 5 and 6—Calculation, Exposure and Compiling Rates.
4. Occupational Diseases—which ones should be included in the injury rates, and how they should be handled.

The question of frequency and severity rates is a very live subject at the present time. There are many diverse opinions as to what injuries should be included in the rates and which ones should be excluded. This question involves the very fundamental issues of, why do we keep injury rates and what do we use them for?

Until 1945 if there were any question as to whether or not to count an injury, the code said to apply the ruling of the local workmen's compensation authority. The American Standard was divorced from the rulings of workmen's compensation commissions by the 1945 revision, in order to obtain greater national comparability of rates. At that time the committee stated that any injuries arising out of and in the course of employment should be included in the rates with 5 or 6 exceptions, or clarifications. Paragraphs 2.1.3, 2.1.6, 2.2, 2.7, 3.4.3, and 3.6.1 might be considered as exceptions.

Since the approval of the standard, the committee has received two further requests for exceptions—one, concerning back



injuries, and a second request, concerning proper compiling of injuries as a result of catastrophies or other non-plant exposures and hazards.

Whether further exceptions should be made to the counting of injuries arising out of and in the course of employment, or whether some of the present exceptions should be abandoned will be one of the most fundamental points to be decided by the sectional committee.

The severity rate is now shown as the days lost for time charges per thousand man hours of employment. In order to provide easier explanation of this item to certain executives or other people who are not too familiar with accident prevention work, it has been suggested that the severity rate should be computed on the basis of a million man hours, the same as the frequency rate.

The Safety Council in the last few years has been showing the average time charges or days lost per injury as a third item in its *Accident Facts*. It has been suggested that this third item be included in any revision of the American Standard.

Although the American Standard provides six classifications of injury: death, permanent total disability, permanent partial disability, temporary total disability, temporary partial disability, and first aid cases, standard comparison rates and all national reporting at the present time are based on only the first four classifications. It would unquestionably be of interest to the American Standards Association to learn how many safety engineers are keeping records of their temporary partial disabilities and first aid cases, and whether or not such records are of value in accident prevention activities.

At least one individual has suggested that it might be simpler to report all injuries arising in the course of empoyment, without regard as to whether or not these injuries also arose out of the employment. The standard would state that such rates will unquestionably include cases over which management has either no control or very little control, but that some accidents, over which management does have control cause only temporary partial disabilities or first aid cases, or no personal injury whatsoever.

These accidents may be of importance as indicating measures which should be taken to prevent future injuries. The inclusion in the rates of all injuries arising in the course of employment might, in a certain measure, compensate for accidents which do not result in personal injury, and rates so kept would be of real value in the prevention of future accidents.

I would certainly appreciate receiving comments either at this meeting or preferably by letter from any members present, who would care to present their opinions on the revision of this code.

MR. THOMAS BOYD [Safety Engineer, Manhattan Rubber Manufacturing Division of Raybestos Manhattan Inc., Passaic, N. J.]: The reason that the subject of reporting was brought up in the Rubber Section is that we are not all reporting in the same way. We wanted to see if we couldn't iron out these differences. I am from New Jersey, where we have to pay for a great many injuries which are not payable in other states, so I have to run two sets of books.

CHAIRMAN LAMB: That is exactly the picture, and it is the reason why this standard was put on the basis that the Workmen's Compensation Rulings do not hold in all cases. In New Jersey a man could fracture a finger and go back to work *immediately* with his finger in a splint or cast. He has no loss of time.

MR. BOYD: That is exactly it.

CHAIRMAN LAMB: According to the American Standard, those cases would not be counted in your contest.

MR. BOYD: Not in the Council contest, but we have to count them for management because every clean fracture with no permanent disability pays at least 5 per cent.

CHAIRMAN LAMB: They would not count in frequency.

MR. BOYD: Wouldn't you penalize yourself for severity charge on that? He lost no time and had no disability but just because he had a fracture and had a scar, he received some money. But you don't count that in the Safety Council contest.

MR. R. M. BOYLES [Director of Industrial Relations, Midwest Rubber Reclaiming Co., East St. Louis, Mo.]: Suppose that were loss of use.

MR. BOYD: In that case, we count it.



CHAIRMAN LAMB: If the award is based on it, you would have to count it both in frequency and severity.

MR. THOMAS J. CAIN, JR.: Is there any strong movement toward throwing out something distasteful to us and, that is, occupational disease? We challenge throwing it right in with other injury.

CHAIRMAN LAMB: The present standard has a very brief statement in it. It says this includes all industrial injuries. It does not say only "industrial accidents," so it includes occupational diseases. The present document was very weak on many points. One is that some states have a specified list of occupational diseases and others include all occupational diseases. I guess there are a few states that don't include any of them. There is also a question as to what the time charges should be for certain injuries, particularly when you get into something that has delayed effects or something like silicosis where there are certain kinds of disability which would be quite different from the accidents. A subcommittee is now studying a proper definition for occupational diseases and how they should be handled in computing the rates. No doubt the recommendations of that subcommittee will be considered when a revision of this document is started.

MR. ROLAND KASTELL: I think the present code allows too many loopholes. For example, in Indiana you are held liable for practically every hernia. We don't feel they are all arising out of employment, but the law states that they are. In South Carolina an employee sustaining a serious laceration may receive some permanent disability benefits.

CHAIRMAN LAMB: I know only about the American Standard method. I am not sure as to just how many people use it. We certainly hope to encourage people to use it and to use it correctly so that when you do send in your figures to the Safety Council or when you fill out one of the questionnaires for the Bureau of Labor Statistics, the results will be on a truly comparable basis.

As far as the hernia cases are concerned, the present standard provides that hernia shall be considered as an industrial injury only if it is precipitated by sudden effort and severe strain and meets all of the following conditions: a clear history of the accident and actual pain in the region of the hernia at the time of the accident, and the pain must have been so acute that the employee was forced to stop work until the pain subsided.

This hernia standard has come up for revision. Should all hernias that your Commission accepts be included or should no hernias be included? For instance, there is a group in New York state that for contest purposes has simply said that they don't count any hernias. That works out very well in New York state because that is one of the liberal states. Practically any hernia occurring to a man while working results in compensation being awarded. It does mean, however, that you have one set of rules for the contest and another set of rules governing your dollars and cents payments at the end of the year.

Disfigurement is not classified as a permanent disability. Of course, there is loss of time for a healing period, and you count it for that disability or injury. If there is true, permanent disability, you would count it as a permanent partial disability. If the man recovers completely so that, for all industrial purposes, he was just as good as he was before the injury, you count just the days lost in the healing period.

MR. KASTELL: The company I represent classifies every accident on which we pay compensation as a lost time case. What are the other opinions on this?

MR. JOHN KUMPEL [United Rubber Workers of America, CIO]: Our organization likes to see a company receive a plaque or an award for doing an outstanding job in safety. But we believe that any time a worker gets injured and cannot go back in his regular line of duty and do his job, it should be classified as a lost time accident.

We like to see people go back to work as soon as possible after the injury, but if the worker cannot do his regular job he is a loss to the company. It is costing the company money to put him on a different job, and, in a lot of instances, it is costing the workman too. We think this problem can be worked out if it is done on a national basis so it will be fair to everybody. Then we will really know where we stand on industrial accidents.

You talk about hernias. Would you read that last point you mentioned again for me?

CHAIRMAN LAMB: "The immediate



pain was so acute that the injured employee was forced to stop work until the pain subsided."

MR. KUMPEL: I know from past experience that there are a lot of hernias that happen that have immediate pain, but the injured employee doesn't have to stop work except for perhaps fifteen or twenty minutes or half an hour or two hours. They may stop momentarily and complain about a pain and then work a half hour and then stop fifteen minutes, and maybe the next day they have a hernia. They might have an incomplete hernia. I think if a person is injured in the shop and can't get back to his regular duties, we should call it a lost time accident. It is costing the company money to put him on another job.

CHAIRMAN LAMB: The comments seem to break down into two parts: As far as the hernia is concerned, I know that the committee of judges believes that they should interpret that one phrase to the effect that even if the pain was such that the worker only stopped work momentarily that probably should comply with the standard and should be included.

The other part concerns disability assignments. The American Standard recognizes six different classes of injury. Death, permanent total disability, permanent partial disability, and temporary total disability, are the four classifications which are used today for comparison.

Temporary partial disability or disability assignment refers to the case of the fellow who comes back to part time work or to a different job after an injury. It also recognizes medical treatment cases.

It is recommended that rates be kept on all six of these classes and not just the four for lost time injuries. But if anyone keeps these additional rates on disability assignments and medical treatment cases, they should be kept separate so that the figures can be compared with those of other companies.

MR. PAUL VanCLEEF [Secretary, Van Cleef Bros., Inc., Chicago]: I think there are two phases to this question. One has to do with the contest and the other has to do with the case of the law involved when compensation arises. I believe the purpose of the contest is to create rivalry in order to improve the general record of an industry. When a case gets to the point where it has to be given consideration by an outside agency, we all know that it is likely to take anywhere from days to months before you can determine technically whether the case should be called an accident or not.

If we were to base our rating upon the decisions of the courts, we would be involved in interminable questions that might never be solved. We would not know what our rating was at any particular time.

I believe that the attitude which the ASA is taking in making broad definitions for purposes purely of contest is the right sort of attitude to take. This question as to whether it is going to make it necessary to keep two sets of books, as Mr. Boyd says, is for the present one of those things we might have to do. In other words, I think we must not forget that in one case we are having a contest for the purpose of creating rivalry in order to improve our accident situation, and the other case we are trying to determine whether a man is entitled to compensation for an injury. That often takes the opinion of a court.

MR. G. L. DEAN [Firestone, Memphis]: In our plant we have quite keen competition between departments. They like to build up records. We had a case in one of our departments where a supervisor broke his wrist and went a couple of days, complaining about it, but he did not have it looked at. So then the doctor fixed him up and he went back to his regular job.

But in another case a worker broke his arm in the same place—the same kind of break—and they wanted to bring him in. Naturally, he wanted to come in and work, since he would be getting more money even if he worked in another type of job. So the two departments raised sand and said that we were breaking the good record because we would not let him work.

We have a job for him; we are honest about it. We are not making a job for him. We actually have got a legitimate job that he can do. It put me right in the middle because he had an excellent rating.

We had another case where a man was hit in the eye. He immediately went to get first aid. They didn't want to touch it, so they sent him to the regular eye specialist who told him to stay off. But the old boy came back. He wanted to work. But we had to send him home and call it a compensation case.



CHAIRMAN LAMB: Was the fellow who broke his arm brought back or was he told to stay home?

MR. DEAN: We didn't bring him in. He just came in.

CHAIRMAN LAMB: He had no lost time and was put on a regularly established job.

MR. DEAN: That's right.

CHAIRMAN LAMB: Then what is your question?

MR. DEAN: That is supposed to be a lost time accident?

CHAIRMAN LAMB: No.

MR. DEAN: Wait a minute! The ASA definition says he must be put on his regular job.

CHAIRMAN LAMB: See me after this is over, will you?

MR. GORDON TRANK [Safety Engineer, Hewitt Robins, Inc., Buffalo, N. Y.]: The question I have in mind is whether there has been any pattern of accidents brought to the attention of this committee which would tend to plug some of the loopholes in the existing code.

CHAIRMAN LAMB: I would say definitely—yes. Here is one—2.3, "if an injury occurring in the course of employment aggravates a pre-existing physical condition or weakness, the resultant disability shall be considered an industrial injury and shall be classified in accordance with the ultimate total extent of the injury, except for these second injury cases, which are a very special problem."

Take the case of a man who cuts his finger and then you find out that he is a diabetic. If his finger is amputated to cure him and prevent gangrene, then you have to count that in your rates as one amputated finger and permanent partial disability.

There is another kind of injury that has come before the committee of judges. A man was sweeping out a box car and sat down on the platform and fell forward and hit his head on the platform and was seriously injured. It was learned that he was an epileptic and had a fit. That was a case where his pre-existing condition resulted in an injury and that is not covered here.

Now, the judges have gotten to the point where they think there are about three or four cases in this general category. I don't know whether they have come to an exact decision as to which ones we should include and which ones we should not include.

MR. KUMPEL: Why wouldn't it be good compensation law if any injured worker who goes back to work on light duty and is away from his regular line of duty longer than seven or ten days, be classified as a lost time injury case?

CHAIRMAN LAMB: According to the present rate, as long as he had a light duty job, none of that time would be counted. The committee is giving serious consideration to that. I don't know that there is any particular proposal for change at this time. However, one company has listed a group of injuries, including a fracture that has to be put in a cast, and even if there is no lost time, they put it in their records as a lost time injury with one day lost.

They tried it the first year with the present American Standard, and the next year with this new system, and at the end of the year they had a difference of eighteen cases. In one year they had eighteen cases that were disability assignments and not in the rates and in the two years they had practically comparable experiences. At the end of the second year, they went to all superintendents and foremen and said, "Boys, here are two systems. Here is your record for one year and here is your record for another year. Which do you want?" They all said to put them in the rates as a lost time injury as one day. I am just giving this to you as information of recent developments of what some people are trying on an experimental basis.

MR. LANGLEY [General Electric, Bridgeport]: I think we are all interested in finding how effective our safety program is and that should be an outstanding purpose for the American Standards Code. We have contests and perhaps like to compare our results with those of other industries. But let us take as an example, the one you cited, the diabetic with a cut, I doubt if two per cent of those present, who might profess to be following the Code, would have counted such an accident as a lost time case. If the finger had to be amputated, the amputation does nothing to reflect how effective the safety program is. So we are not going to count it. I think the American Standard Code and any other code ought to bear that in mind.

I do my best to follow the American Standards Code as it is written today, but



it hurts very much to have to take accidents, such as a fellow who finds he can't straighten his knee after bending down to pick up an object on the floor and therefore loses time. That is not a reflection of how effective my safety program is.

CHAIRMAN LAMB: That brings up a very fundamental point that is being debated right now. Should these rates only include those injuries which the engineer admits he could have done something to prevent. Or should these rates include all injuries to the workmen that are affecting the workmen and affecting the financial picture as either medical losses or compensation losses.

As far as the diabetic is concerned, certain companies have examinations for their employees. If such examinations show that a man is definitely a diabetic, he should be put on a certain type of job, and maybe there are certain jobs in your plant that should not be open to that man. There are many large organizations that have prepared a fine analyses of certain handicaps and have given suggestions as to what jobs should be open to those men.

Apparently there are some safety engineers today who recognize that it is only a part of good management and of accident prevention to properly place handicapped workers. I think that takes care of the diabetic.

The second point is that the employee who bent down and could not straighten up was considered as a case. There is a small group of injuries which everybody will agree arose out of and in the course of employment. As far as I know, there doesn't exist a safety engineer who knows how to prevent them, but I would say in the course of a year or in the annual records of the *Accident Facts* of the National Safety Council, that represents a very small per cent.

It is true that if some particular department has gone along for a long time with a perfect record, they hate to break their record with that kind of a case. But experience has been since the 1945 revision that there has been more controversy and more complaint because of the few exceptions to this arising out of and in the course of employment, than if you would count all of them.

One or more people are recommending that you should include all injuries arising in employment in your frequency and severity rates on the basis that there definitely will be some of these that cannot be foreseeably prevented, but in other cases injuries don't happen purely by chance.

MR. RHODES [Midwest Rubber]: All of our jobs are put up for bid. How are you going to put a fellow who is injured in that kind of a set-up?

CHAIRMAN LAMB: What do you mean—for "bid"?

MR. RHODES: For seniority. If they can do it, what are you going to do—take the other fellow off of his job?

CHAIRMAN LAMB: It says, "the regularly established job is one which has not been established especially to accommodate the injured employee either for therapeutic reasons or for counting the case as a temporary case of disability. If the person is returned to the job other than his own, the injury shall be classified as a partial disability."

This question came up before a committee of judges: A fellow given one of these "other regularly established jobs" which would be open and available to him would work on it for three days. At the end of that time, there would be a certain number laid off and due to seniority somebody else would get that temporary job, and he would be laid off. There would be no other regularly established job open and available to that man after that third day. Therefore, the committee ruled that after that third day the case would become a temporary total disability for the rest of the time that the man was out from the injury.

MR. RHODES: It looks to me like it is a case of luck, then, if you happen to have a job open.

CHAIRMAN LAMB: Definitely. The wage loss is not directly considered here. If he is put on a temporary partial disability, the case is not counted in the regular standard frequency rates. If you are interested in getting into the details, there is a publication of the Bureau of Labor Statistics on computing rates which shows a formula for computing days lost on a temporary partial disability. It is on the ratio of the money he gets to the money he would have gotten.

In order to cut out some computation, the American Standards says a charge of one-half of the calendar days of disability may



be made to evaluate the severity of temporary partial disabilities or disability assignments.

MR. CARSON [Eau Claire, Wisconsin]: Why doesn't the American Standard Association take into consideration the relative value of fingers on a hand. In the state of Wisconsin it makes quite a difference whether it is an index or a little finger and I think it is fair. There should be a differentiation.

CHAIRMAN LAMB: That is a good suggestion. I don't think that is before the committee at this time.

MR. GREENHAUS [Chairman of the Foremen's Club, Safety Committee, B. F. Goodrich Co.]: I am wondering what the understanding is if a man gets hurt and is not able to perform any part of a day's work, whether it is on his regular job or any other job. In other words, let's say that a tire builder breaks his arm and you put him out counting stacks of tires.

CHAIRMAN LAMB: Is it a regular job?

MR. GREENHAUS: They call it that. Who takes care of those regular jobs when you don't have an injured man?

CHAIRMAN LAMB: Let's put it this way. I don't think there is anything now in the American Standard that will keep a man from being dishonest. I don't think we can put anything in the American Standard that will keep a man from being dishonest.

MR. Van CLEEF: It seems to me that we are losing sight again of the purpose of some of these records. Even though we might have to put him on a job that is not open regularly, first of all, we want to save that man money, although we do pay time lost due to an accident. We want to have people get back on the job as quickly as possible because we believe it is good for the morale of everyone in the organization.

I think the rule for him in the ASA standard on that is purely a basis on which everybody can agree. If we are going to throw more and more complications into what may be regarded as an injury or accident, we are going to make it much more difficult to carry on these contests. We are going to have, then, a board of directors that will have to be sitting all of the time because there would be innumerable questions arising as to what we should regard as this or that injury or that accident.

## Selling Safety

By BENSON G. MUNYAN
Sales Analysis Institute of Illinois

In this country most people are trained from childhood to believe in democratic processes. Children get practical experience in democratic processes as they vote for class officers, representatives to student councils, youth centers, and the like. They are told that they can have a voice in government and they grow up believing that it is their right to have opinions, to express their opinions, and, above everything, to make decisions in matters affecting their own personal welfare. As their parents, we spend a good deal of time during their early life helping them to assimilate this viewpoint.

Teaching them to think and make decisions as we do, can we expect them to change when they become adults? Can we expect them to be enthusiastic about rules in the formulation of which they have had no part? Actually would we want them to? Yet how many times that you know of have employees been asked to help draw up codes of safety rules? In how many companies are the employees handed a book of rules that in effect say "Follow this or else!"

Consider another thought. Employees generally feel that they are held responsible for production. To put it bluntly, they feel that they'll catch hell if they don't get it out and sometimes they feel that safety measures interfere with their making production.

In a case that comes to mind, there was a circular saw used in the shipping room of a large company in Illinois. The men



there had to handle sharp material so they wore heavy leather gloves. When they used the saw they would keep their gloves on and, because they were big and heavy, it was awkward holding the lumber being sawed. Sometimes the lumber would get away from them and their hands would be thrown into the saw. Many injuries resulted and yet the men were reluctant to remove their gloves before using the saw because, as they said, it slowed them down.

Employees sometimes shirk safety rules or forget them, causing troubles that can greatly discourage the man whose main job is safety. Accidents continue to occur and lower his prestige. His voice and ideas carry less and less weight in the organization, and more and more often he is overruled in his ideas and frustrated in his efforts towards an accident-free organization. He is often looked down upon as a nuisance who interferes with important work.

Our experience indicates that most supervisors welcome definite types of things they can say or do which will make employees give safety the prominent place in their minds to which it is entitled.

There are tools that properly used will accomplish this but, unfortunately, there is no quick or easy way to do a thorough job. In fact, before it can be accomplished, most of us must first train ourselves to present our ideas in such a way that the employees will want to cooperate. That takes time and plenty of it. It is impossible to even mention all the tools available in the fifteen minutes we have here, but there are a few that are easy to learn and simple to use that will help in many situations we face in our daily lives.

To make the most of our time here, I am going to ask you to go along with me on a couple of thoughts. The first thought is this: *The only reason we do things is so that we may benefit*, that is, so that we may improve our conditions. The second thought is: *We cooperate more intelligently if we understand the purpose of what we are asked to do.*

In the course of our lives, we form many habits and because they make our day to day life so easy, we tend to resist changes in them.

Keeping this in mind, we will find that we can make the proper impression right at the start and prevent misunderstanding as to our motive, if we first mention why we want our listener to do a thing and then tell him what to do.

For illustration we might take the case of the man wire buffing defective tires who should wear goggles on his job, but who isn't doing so. We have to talk to him about it. To most supervisors the important thing to talk about is "wearing the goggles." But is that most important to the workman? No, for him the *reason* for wearing the goggles is more important, that is, the protection of his eyes.

If we think of our real purpose in wanting him to wear his goggles we'll see that we actually want the same thing that he wants, the protection of his eyes. We both have the same objective in this respect. We actually don't care so much how he protects his eyes, just so they are protected. Accordingly, if we tell him "to protect those eyes of yours, Bill, you had better put on your goggles," he will realize that we are trying to help him and that it is to his advantage *to do* so, and he will more than likely go along with us. On the other hand, if we do what is most natural and merely tell the man to wear his goggles, he too often feels that we are using our authority to push him around. He will probably do what we asked, but he'll make up his mind to get even with us somewhere else.

Sometimes we do remember to tell him "why" after we tell him "what," but too often by the time we get to the "why" his mind is already so busy alibing that he doesn't give fair consideration to our purpose. He is still resentful. Now you may feel that this idea is all right, but that it isn't always necessary. I know you can think of many cases where employees, when told merely what to do, have snapped to it cheerfully. As we analyze the situations where this has happened, we usually find that what he was told to do was part of his routine duties and he looks upon your direction as a signal as to which of his regular duties to do next.

It is a safe bet that where a change is involved, at least half the time we'll run into some degree of reluctance to follow our directions. So if you will first determine our objective and mention "why" before "what" when giving safety instructions, you will find that in a short time many little disagreements have disappeared and that your men are questioning less and following more willingly your directions regarding not just safety, but also production, quality, and all the other factors that must be considered in a manufacturing organization.

There is no doubt but what safety must be sold orally by people close to the person being sold. However, we can get an assist, but only an assist, from properly worded signs. You can go into nearly any factory these days and you see many signs, some saying "do this," or "do that," "wear safety shoes," or "no smoking."

How does the average employee feel about these signs? Most of them feel that it is a case of someone showing his authority. Now, of course, that is not the idea behind the signs at all. Management has spent a lot of money for those signs and a lot of time figuring out the need of the sign, but do employees realize that? For the most part they don't.

In a southern plant they were having trouble in the men's shower room where only bar soap was supplied because the men were very partial to a particular kind of liquid soap used in other parts of the plant, and they would carry this liquid soap into the shower room in a coca cola bottle. These bottles would be left on the floor and get knocked over and broken. Several men suffered cuts on their feet due to this.

So management put up a sign in the shower room saying "Do not bring bottles into the shower room." Still bottles kept going in. So management decided that something was missing in the sign and added the word "positively" to it. Still bottles were brought in. Finally the sign was changed to include the purpose and said, "To protect your feet from cuts and keep your earnings intact, leave bottles outside the shower room." Since that time several months ago, no bottles are known to have been brought into the shower room. Instead of having rules and regulations shoved in their faces continuously, now they could see some one was trying to help them.

In the plant I mentioned before where they were having trouble on the circular saw in the shipping room, a sign was put up over the saw, "Remove your gloves before using this saw." How did the men accept this sign? In the same way we mentioned before. They kept their gloves on and accidents kept happening.

Finally the sign was changed to read, "To protect your hands, remove your gloves before using this saw." Immediately the men saw the purpose, their attitude changed, they removed their gloves before using the saw, and accidents stopped.

Now it is easy to say that in both of these cases the reasons for the requests were so obvious that there should have been no trouble, that the men should have thought of the reasons why they were asked to do these things. They should have, but the peremptory tones of the original signs were such that they became so resentful that they didn't want to think. As the men in the Illinois plant said, "This place is full of rules and regulations—to hell with them." On the other hand, few men want to deliberately hurt their chances of realizing their objectives. Properly worded signs, by constantly reminding them of their objectives, help keep them thinking and acting straight.

I think every supervisor realizes how difficult it is to keep the employees in his department thinking along the line of important objectives. For example, a supervisor may give quite an extended talk to employees on the matter of safety and all of them may agree that they are going to be very careful in their operations in the future.

Often it is only a matter of days until some of them forget all about safe practices and do something that violates every principle of safety. This naturally discourages a supervisor and makes him feel that it is impossible to keep the minds of his employees on important objectives. Wouldn't it be a tremendous help to have some means whereby we could keep every person thinking about safety and yet prevent them from feeling that we are hounding them or giving too many talks on safety? We can do that by watching for cases where they are practicing safety and compliment them for it, following the compliment with mention of the reason why they deserve the compliment and the benefits to them that come as a result of what they are doing.

Suppose while going through the tire room we see a truck tire builder carefully





straightening the band of two ply before spinning it onto the building drum. We could say something like this, "I'm glad to see you getting that band straight. That's the way to protect your arm from getting pulled in a fold up."

The tire builder might have straightened the band without giving it any special thought. He might have done it through habit, but when we make a statement of that kind, he can't help but feel a lift and then he would recall and think favorably about the talk on safety where straightening bands was mentioned.

All the other thoughts brought up in the talk about safety would also come back in the employee's mind in a favorable way. The compliment would pep him up and make him feel kindly towards us, but just as important is the fact that mentioning benefits along with the compliment remind him that it is just good, sound business to continue safe practices, and so his mind cooperates along a reasoning line as well as an emotional one.

Too often supervisors feel they are doing the proper thing if they just look for violations, then try to correct the violator. We do, of course, have to correct people who are not following proper methods but the stronger method by far is to guide the thinking of everyone by means of compliments and benefit statements, so that their minds force them to do their thinking in the right way and so they want to cooperate by following good practices. If we do this, we make them think of safety in connection with every operation of their jobs, and yet we stay away from continuously lecturing them on safety.

In summarizing, we must realize that men tend to think of their own interests and their own desires before they think of what we want them to do, and if we are to get them to take the right actions on safety or any other important phase of their work, we must talk to them in terms of those interests. If we do, our rewards will be increased production and improved quality records, and the satisfaction of seeing men become enthusiastic and self-disciplined in regard to safe practices.

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# Ionizing Radiations

By REX H. WILSON, M.D.
Medical Director, The B. F. Goodrich Company, Akron, Ohio

The impact of the atomic age has made it necessary for all persons interested in industrial health to become cognizant of the problems arising from the use of ionizing radiations. Ionizing radiations is a descriptive term for that type of energy which has, as one of its chief characteristics, the ability to ionize the matter through which it passes.

It has been recognized for many years that certain types of this radiation are harmful and precautions must be taken in their uses. The damaged hands, amputations, development of multiple carcinomas, and the painful deaths which have occurred to many who have used x-rays and radium bear mute testimony to this fact. Experience gained during the first World War showed that radio-active compounds, if improperly handled, can be fatal to personnel. It required, however, the splitting of the atom and the birth of the atomic energy industry to crystalize the fact that additional knowledge must be secured with respect to radiation hazards.

Ionizing radiations may be of the following types: alpha, beta, x-or gamma, and neutron. The alpha, beta, and x-or gamma radiations are of most industrial importance at the present time. As the use of atomic energy increases, neutron radiations will take on increasing importance. The alpha, beta, and gamma radiations all result from nuclear fission. X-radiation is quite similar qualitatively to gamma radiation, excepting that the wave length of x-radiation is considerably greater, and it is produced artificially in electronic devices, the most common of which is the x-ray tube.

The use of x-rays in industrial applications has been tremendously expanded in the past few years. This increased use has



also been accompanied by increased operating voltages. It is well known that the penetrating power of x-rays increases as the operating voltage increases. Operating voltages ranging up to one million are not uncommon.

X-rays are being used industrially at the present time for the examination of such things as metals, welds, food packages (for the presence of foreign bodies), munitions, tires, rubber belts, etc. The x-ray machine is kept in constant use at many of these operations. Proper protection must be provided to operating personnel from exposure to the direct rays, and to the less penetrating secondary radiations which result from the scattering of the primary rays. In most industries the x-radiations are created by x-ray tubes. However, industrial radiography in which radium is used as the source of gamma rays is also practised.

A possible exposure to x-radiation may also result from the use of electronic heating units. This type of heating is finding increased usage, especially in the rubber industry. Theoretically it is possible to obtain x-radiation from the electronic tubes used in these devices, if the operating voltage is ten thousand or greater. The x-rays so produced will possess little penetrating power unless the operating voltages are considerably higher and will probably be stopped by the metallic shielding of the unit itself. The amount of x-radiation produced should be determined when designing any of these units in order that proper protection can be provided.

It is also well to check the electronic units during their operation to determine the existence of any x-radiation in the workroom area. The amount of such radiation can be readily determined quantitatively by using any of the commercial instruments now available for this. Qualitatively its presence can be detected by locating at strategic points near the units, small dental x-ray films and noting the darkening of such films after 24 to 48 hours of exposure. The health committee of the Rubber Section of the National Safety Council is currently engaged in determining the extent of the x-ray hazard which may exist at these units.

Both alpha and beta radiations result from the normal radio-active decay of certain radio-active materials. The static eliminator bars which have been recently placed on the market use these radiations to reduce the possibility of fire or explosion in solvent vapor atmospheres by ionizing the air to prevent excessive static charges arising.

One type of static eliminator device contains radium as the radio-active material; the other, polonium. Radium is an alpha emitter, but some of its decay products emit both beta and gamma radiations. Polonium is a pure alpha emitter.

From the standpoint of external exposure alpha rays present little or no radiation hazard, provided the source of them is kept more than three inches away from the skin. They are stopped by approximately three inches of air and by any thin membrane such as the skin itself. Beta and Gamma rays vary widely in penetration, with the beta rays of radium C—one of the decay products of radium—having a maximum penetrating power of about 34 feet of air. The gamma rays resulting from this same radio-active process have even greater penetrating power. It is, therefore, self-evident that proper shielding, to protect against harmful exposure to the beta and gamma radiations resulting from these devices, should be used.

The use of radio-active isotopes in industry is still confined largely to the field of research and development. Their use is certain to increase and they will in all probability be applied to various phases of manufacturing within the next few years. Theoretically it is possible to produce radio-active isotopes of a great majority of the chemical elements. A limited number of these isotopes are at the present time commercially available. Their production and end use is controlled by the Atomic Energy Commission.

The types of radiation resulting from these isotopes vary quite widely both quantitatively and qualitatively. Not only must adequate shielding be used to protect operating personnel from the various types of external radiations resulting from the isotope, but personal contact must be avoided and proper personal sanitation employed to protect against the accidental ingestion or inhalation of any of these materials. The disposal of the radio-active isotopes is also quite a problem.



The use of radio-active isotopes in medicine has been practiced for several years. This usage has been confined largely to radio-active phosphorus and iodine. More recently radio-active carbon with an atom weight of 14 has become available. This material offers tremendous opportunities for unlocking many of the secrets in the biological and physical sciences. When it is realized that carbon is the common element of all organic matter the scope of this opportunity can be somewhat visualized. The production of radio-active plant species, radio-active animals that may in turn produce radio-active serums and even radio-active viruses and bacteria would not appear to be an impossibility.

Just as these radiations ionize gases through which they pass, so do they ultimately ionize human tissues. The demonstrable effects arising from their physiological action on the human organisms vary quite widely.

Every kind of ionizing radiation is similar in its clinical action. A slight amount of radiation is sufficient to damage white blood cells, whereas the nervous system seemingly can withstand tremendous amounts of radiation. At the present time the most sensitive indicator of possible injury to personnel coming in contact with ionizing radiation is the white blood cell count. A lowering of this is the usual result of exposure to a pathologically effective dose. The lymphocytic elements of the white blood cell series seem to be the most affected. Epilation, reddening of the skin, atrophic changes or hypertrophic changes may occur with skin exposure. The reproductive organ may be affected with changes occurring in the gonads. Sterilization may occur or there is a possibility of causing alterations in the offspring.

It is of importance to remember that the person at the time of immediate exposure has no indications that exposure is taking place. There is no pain or alteration of sensation, and there is no way in which a person may learn by his own sensations that he is in a region of danger. Consequently, adequate safeguards to supply this missing information are of importance.

Personnel who are engaged in operations presenting possible exposure to ionizing radiations should be given medical examinations, which should include a complete blood count, at regular intervals. Their removal from exposure should be demanded at the first indication of an abnormal low white count. The operations themselves should be routinely evaluated for the quantity of radiation existing. The present thinking is to maintain all radiation levels below a value of 0.1 roentgen per eight hour day.

It is also well to use a monitoring system for exposed personnel. This can be done by having the personnel wear small pocket ionization chambers in the shape of a fountain pen which discharge at a predetermined level—usually 0.1 roentgen. Film badges can also be worn and developed at the end of each day or week and the amount of radiation received by the individual quantitatively determined. A service of this type is commercially available whereby the badges are supplied, developed, and read for a small service charge.

In conclusion, I should like to emphasize that the use of ionizing radiations is a problem which requires close scrutiny on the part of safety, industrial hygiene, and medical personnel. Its use presents tremendous opportunities to industry and will be expanded constantly. This use is hazardous and must be properly controlled or serious injury and death may result to operating personnel.

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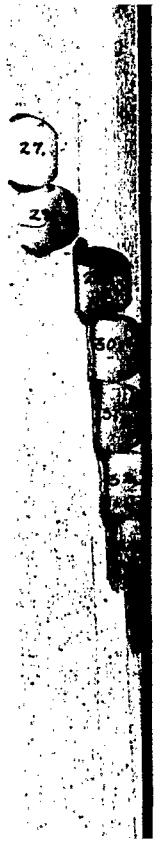
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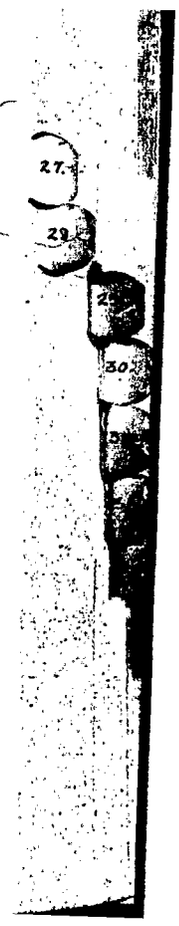
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**1948 National Safety Congress**

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In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

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In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.



## THE TEXTILE SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Textile Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Textile Section carries on in behalf of its members, and for the benefit of accident prevention work in the textile industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of textile plants. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on page 31 of this volume.

# Industrial Hernias

By W. G. THUSS, M.D.
Thuss Clinic, Birmingham, Ala.

"Hernias" seem to develop or appear with the greatest of ease, and I have long since learned that it is a good idea not to tell a patient, even though a "hernia" is not found on original examination, that he will not develop one. I can still recall my embarrassment after having examined a man, and assuring him that he would not develop a rupture, to have him return in about three months with one fully developed.

The medical literature contains many detailed articles and references about "Hernias"—their embryological development; the symptoms, both subjective and objective; the findings on examination; the various operative techniques and procedures and the postoperative care, as well as the statistics as to the final results.

The term "hernia" or "rupture" is used to denote the protrusion of any organ, or tissue, from its normal position through an abnormal opening or a defect. The popular use of the term "rupture" as a synonym for "hernia" implies a violence which seldom exists and should be avoided. "Hernias" have always reminded me of the casing of an automobile tire. The tire might seem to be perfectly sound and good for many *miles; however, a sudden puncture develops,* or it unexpectedly "blows out." When the tire is taken to the repair shop the man examines the inside and says that the cords have been damaged, causing the tire to weaken and give way. Obviously, it is impossible to tell whether this damage to the inside of the tire results from a sudden shock such as running against a curbing, *or whether it results* from the original construction of the tire.

An "industrial hernia" is one which satisfies the requirements of the Workmen's Compensation Act of the particular state in which the person is working. With the rapid spread of workmen's compensation legislation, there has come up for judicial decision a mass of cases involving the question of whether a specific "hernia" was due to strain of lifting, a fall, a blow or some *other incident of employment*, or on the other hand was a result of an inherent weakness. This important matter has two aspects which must be separated. First, the *study of "hernia" from a scientific stand*point as a pathological entity; second, the interpretation of the law as applied to groups of people. If a decision grants compensation to a workman for "hernia," it does not necessarily follow that the "hernia" was caused by his work, but simply means that under the interpretation of the law, as applied to that case, the man is entitled to compensation.

For the purpose of this discussion, only "hernias" of the groin will be considered, all others being comparatively rare. For the sake of convenience we will group these "hernias" of the groin into: (1) indirect, (2) direct, (3) femoral, (4) postoperative, and, (5) recurrent. Briefly, an indirect "hernia" is a "hernia" which protrudes from the internal ring, extends along the inguinal canal to later present itself at the external inguinal ring. The direct "hernia" comes directly through the abdominal wall at Hesselbach's triangle. The femoral "hernia" comes through a patent femoral ring, or one whose closure is too weak to withstand the constant intra-abdominal pressure.

Occasionally claims are made in industry for postoperative "hernias." This is the type of "hernia" that develops in a surgical scar. The scar following an appendix operation, with drainage, is usually the most common. This does not present a very frequent problem. Recurrent "hernias" are well explained by the term and need no particular discussion as they are, fortunately, not too frequent.

What, then, is the cause of these "hernias"? Stone has stated that one essential condition for the existence of an abdominal "hernia" is the presence of a defect in the limiting structures of the abdomen which permits part of its contents to protrude beyond the normal confines. There are many theories as to the etiology or cause of "hernias" from an anatomical standpoint. However, I can see no point in discussing such a debatable issue and will briefly state that the opinion, as expounded by Russell, is the most universally accepted.

The Russell theory is the saccular theory and explains the etiology of "hernias" on the basis that the processus vaginalis fails to become normally obliterated, either in whole or in part. This means simply that as the testicle descends into its normal position in the scrotum, there is a closure failure. A defect is left. If an opening develops, and there is a protrusion, we call this protrusion a "hernia."

*Indirect "hernias,"* which are by far the most frequent of the group, result from this incomplete obliteration of the peritoneum taken into the scrotum when the testicle descends. This failure of obliteration may be complete, with the sac extending around the testicle, and this is the so-called "congenital hernia." More frequently, the peritoneal pouch is obliterated, and the rest of the wall sticks together, possibly to give way many years later.

The importance of "hernias" in industry is obvious, as it is probably the greatest single cause of rejection on preemployment examination. Opinions vary as to the percentage of "hernias" among males between 20 and 70 years; although it is probably about 10 per cent, some industrial examiners have estimated as high as 15 per cent. A large percentage of the companies, for which we are the physicians, have preemployment examinations. These companies represent a cross-section of industry in the age group from 16 to 60.

We have found that congenital "hernias" are more common in the younger men and that the acquired "hernias" are more frequent in the older men. The reason for this seems to be obvious. "Hernias" developing following preemployment examination are more likely to fall in the category of "traumatic hernias." I do not feel that the term "traumatic hernia" is as descriptive as the one apparently first used by Mock[1]—"compensable hernias." There are wide variations of compensability, depending on the interpretation of the law in various states. The actual presence of a "hernia," as a matter of fact, must be established by a physician on physical examination, while its compensability is left to the claim adjusters of the various insurance companies, or to the medical referee, or possibly to the court.

"Relaxed rings" and "potential hernias" are overworked terms in industrial medicine, which should be revised. Colcord[2] carefully examined 6,000 men and, of this number, estimated that 500 had relaxed rings or potential "hernias." Ultimately 25 of the 6,000 men so examined developed "hernias," but, it is a strange fact that none of the 25 were in the 500 group, which had been classified as having relaxed rings, or potential "hernias."

Isaac[3] states, that legal discussion in the United States and elsewhere is to the general effect that the contributory role played by industrial occupation places "hernias" in the general category of compensable injury and concludes that, while the sac is always present and preexists, the "hernia" may be aggravated by trauma if the force is adequate.

Dr. John Moorehead[4] of New York City presented an analysis of 1376 herniotomies and came to the same conclusion. Since his closing remarks are of interest, I think they should be quoted. "I may say that, in so far as the Compensation Board in New York is concerned, it does not make very much difference what our preconceived notions are, or what the anatomic basis may be, or what the surgical or pathological findings may be. Their view-point is that the man didn't have it—meaning a hernia—before he got hurt, he has it now and that is the end of that."

It is the general consensus among industrial surgeons that a true traumatic "hernia" is an exceedingly rare condition. This term would presuppose the actual and immediate giving away of the tissue with the descent or formation of a herniating mass, severe pain and symptoms so distressing that the attendance of a physician would be required within twenty-four hours.

About fifteen years ago, Dr. C. N. Roberts, at the Nineteenth Annual Meeting of the International Association of Industrial Boards and Commissions, made a statement which seems to me to have set the medicolegal pattern. He said, "It matters not whether a hernia existed before an alleged strain, certainly the fundamental defect was present. It cannot be denied that injury alone is an extremely rare etiological factor of hernia, but it does matter whether the hernia, which antedated the injury has, by strain, been changed from a



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By W. G. THUSS, M.D.
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"Hernias" seem to develop or appear with the greatest of ease, and I have long since learned that it is a good idea not to tell a patient, even though a "hernia" is not found on original examination, that he will not develop one. I can still recall [illegible] barrassment after having examined [illegible] and assuring him that he would [illegible] a rupture, to have him return [illegible] months with one fully dev[illegible]

The medical literature [illegible] tailed articles and refe[illegible] nias"—their embryolo[illegible] the symptoms, both s[illegible] tive; the findings o[illegible] various operative techn[illegible] and the postoperative [illegible] statistics as to the fi[illegible]

The term "hernia" [illegible] to denote the protrusi[illegible] tissue, from its normal [illegible] abnormal opening or a [illegible] lar use of the term "rupt[illegible] for "hernia" implies a vi[illegible] dom exists and should be av[illegible] have always reminded me of [illegible] an automobile tire. The tire [illegible] to be perfectly sound and good [illegible] miles; however, a sudden puncture de[illegible] or it unexpectedly "blows out." When the tire is taken to the repair shop the man examines the inside and says that the cords have been damaged, causing the tire to weaken and give way. Obviously, it is impossible to tell whether this damage to the inside of the tire results from a sudden shock such as running against a curbing, or whether it results from the original construction of the tire.

An "industrial hernia" is one which satisfies the requirements of the Workmen's Compensation Act of the particular state in which the person is working. With the rapid spread of workmen's compensation legislation, there has come up for judicial decision a mass of cases involving the question of whether a specific "hernia" was due to strain of lifting, a fall, a blow or some other incident of employment, or on the other hand was a result of an inherent weakness. This important matter has two aspects which must be separated. First, the study of "hernia" from a scientific standpoint as a [illegible] logical entity; second, the [illegible] law as applied to [illegible] ion grants compensation for "hernia," if [illegible] the "hernia" [illegible] it simply [illegible] of the [illegible] an is [illegible] only [illegible] ed, [illegible] or [illegible] ip [illegible] n- [illegible] t- [illegible] an [illegible] ong [illegible] f at [illegible] her- [illegible] ominal [illegible] femoral [illegible] femoral [illegible] oo weak to [illegible] stra-abdominal [illegible] are made in industry for postoperative "hernias." This is the type of "hernia" that develops in a surgical scar. The scar following an appendix operation, with drainage, is usually the most common. This does not present a very frequent problem. Recurrent "hernias" are well explained by the term and need no particular discussion as they are, fortunately, not too frequent.

What, then, is the cause of these "hernias"? Stone has stated that one essential condition for the existence of an abdominal "hernia" is the presence of a defect in the limiting structures of the abdomen which permits part of its contents to protrude beyond the normal confines. There are many theories as to the etiology or cause of "hernias" from an anatomical standpoint. However, I can see no point in discussing such a debatable issue and will briefly state that the opinion, as expounded by Russell, is the most universally accepted.

The Russell theory is the saccular theory and explains the etiology of "hernias" on the basis that the processus vaginalis fails to become normally obliterated, either in whole or in part. This means simply that as the testicle descends into its normal position in the scrotum, there is a closure failure. A defect is left. If an opening develops, and there is a protrusion, we call this protrusion a "hernia."

Indirect "hernias," which are by far the most frequent of the group, result from this incomplete obliteration of the peritoneum taken into the scrotum when the testicle descends. This failure of obliteration may be complete, with the sac extending around the testicle, and this is the [illegible] called "congenital hernia." More [illegible] quently, the peritoneal pouch is ob[illegible] and the rest of the wall stick[illegible] possibly to give way many yea[illegible]

The importance of "hernia[illegible] is obvious, as it is probabl[illegible] single cause of rejection on [illegible] examination. Opinions var[illegible] centage of "hernias" amon[illegible] 20 and 70 years; althou[illegible] about 10 per cent, some inc[illegible] have estimated as high as [illegible] large percentage of the [illegible] which we are the physicia[illegible] ployment examinations. T[illegible] represent a cross-section of [illegible] age group from 16 to 60.

We have found that congeni[illegible] are more common in the younge[illegible] that the acquired "hernias" are [illegible] quent in the older men. The reas[illegible] this seems to be obvious. "Hernias" [illegible] veloping following preemployment examina[illegible] tion are more likely to fall in the category of "traumatic hernias." I do not feel that the term "traumatic hernia" is as descriptive as the one apparently first used by Mock?—"compensable hernias." There are wide variations of compensability, depending on the interpretation of the law in various states. The actual presence of a "hernia," as a matter of fact, must be established by a physician on physical examination, while its compensability is left to the claim adjusters of the various insurance companies, or to the medical referee, or possibly to the court.



"Relaxed rings" and "potential hernias" are overworked terms in industrial medicine, which should be revised. Colcord carefully examined 6,000 men and, of this number, estimated that 500 had relaxed rings or potential "hernias." Ultimately 25 of the 6,000 men so examined developed "hernias," but, it is a strange fact that none of the 25 were in the 500 group, which had been classified as having relaxed rings, or potential "hernias."

Iason states that legal discussion in the United States and elsewhere is to the general effect that the contributory role played by industrial occupation places "hernias" in the general category of compensable in[illegible] that, while the sac is [illegible] sets, the "hernia" [illegible] if the force [illegible] k City [illegible] mies [illegible] nce [illegible] k [illegible] is [illegible] im- [illegible] the [illegible] g mass, [illegible] atressing [illegible] sician would [illegible] four hours.

About [illegible] years ago, Dr. C. N. Roberts, at the Nineteenth Annual Meeting of the International Association of Industrial Boards and Commissions, made a statement which seems to me to have set the medicolegal pattern. He said, "It matters not whether a hernia existed before an alleged strain, certainly the fundamental defect was present. It cannot be denied that injury alone is an extremely rare etiological factor of hernia, but it does matter whether the hernia, which antedated the injury has, by strain, been changed from a

quiescent development defect into one of greater degree. Common sense supports the view that although traumatic hernia in the strict sense is most infrequent, compensable hernia, because of aggravation by strain, is exceedingly common."

Our work has brought us into contact with the question of "industrial hernias" on many occasions. Excluding for the moment the man who comes up for preemployment examination and is found to have a "hernia," it seems to me that it makes little difference whether we name the baby "traumatic hernia" or "compensable hernia." Industry has a problem which rightly deserves broader consideration than has heretofore been given.

I mention the "hernia" found on preemployment examination. Assuming that a man is otherwise a good risk, we will not pass a man with a "hernia" until it is repaired. We feel that this defect will give him trouble, that it definitely decreases his efficiency as a workman, and that he presents an industrial hazard. Repair of the "hernia" is a satisfactory surgical procedure and, as Dr. L. S. Fallis[6] reports, 93.4 per cent can be cured. As a rule we feel that a "hernia" operation can be compared to an appendix operation—usually not so much an emergency, but just as necessary.

In passing, I would like to stress the value of preemployment examinations. I like the term "placement service" better. The idea is to put a man where he is physically able to work. If a man is handicapped, employ him to his own and to industry's best advantage; but do not put a cripple to work digging ditches or coal.

A recent court decision in our state not only made legal history, but actually brought this subject to industrial attention. An employee of one of our large steel mills was found to have a "hernia." The insurance company investigated the case and came to the conclusion that the "hernia" had existed prior to employment, and they denied liability. The claimant brought suit against his employer but, before the case came to trial, the insurance carrier offered the man an operation which he turned down on the grounds that such an operation would endanger his life. A claim for permanent total disability resulted, with a decision in favor of the injured employee by the Circuit Court and later affirmed by our State Supreme Court.

It is our practice to advise operation for all industrial workers who have "hernias." The risk is slight, since the mortality rate is well under one per cent, and the probability of cure is well over 90 per cent. I do not agree with Bratrud[7] that, "Any employee or prospective employee, who develops or is found to have a hernia, should be immediately fitted with a well-fitted truss." Wearing a truss has little to commend it and few actually accomplish what is expected, largely because they are inexpertly fitted and, in many instances, actual harm is done by pressure atrophy of the musculature of the inguinal canal. Occasionally we will advise a man of rather advanced age, or a poor surgical risk, to try a truss; otherwise, we are in favor of the operative procedure.

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## Safety—Your Best Personnel Program


By JOHN M. SCOTT, JR.

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To my mind safety is your best personnel program because it contains all the elements necessary for industrial peace. But more important it contains a magic formula which can be applied to almost any problem in industry. Properly applied this formula can do much to help capitalism in its struggle against the various forms of collectivism which are opposed to it today.



There can be no doubt that this formula exists. Other industrial plans and programs come and go like the seasons of the year. But safety carries on. Our problem, then, is to see how this formula can be applied in other industrial situations.

Psychologists tell us that we are driven in the main by selfish aims. If this is true I doubt if more than a few of us are deeply concerned with what will happen to capitalism a hundreds years from now. Each of us is concerned with what is going to happen to *me*. Then in describing this magic formula in safety we must do so in terms of *individuals*.

Someone has said that the problems of a nation or a society are merely personal quandaries multiplied many times. From what I have seen of the textile industry this is true. If you will ask around it won't take you long to find out that most of the people in the industry are having trouble with the same basic issues you are facing in your mill. With few differences these same conditions exist in all types of plants. So if we can find a way to attack the problems of the textile industry, won't we be making a contribution to American industry as a whole?

What are the end results of a well-run safety program? What does safety accomplish in American industry in the way of sustained results that are not found in other industrial programs? The answer is so simple we may have overlooked it because of frequency rates, contests, awards, and the many other details that go into administering a safety program.

Safety accomplishes two things. First, from the business man's point of view, it will put you in a better competitive position. It may be difficult to measure the savings that are afforded in exact dollars and cents. But it has long been an axiom of American industry that a safe plant is likely to be an efficient plant. Otherwise you can be sure that safety programs would have ended in the scrap heap long ago. The safety director who does not give his boss at least an estimated savings report is doing the cause of safety an injustice. The facts are there, especially in those states where workmen's compensation funds are handled on a merit rating basis.

Second, but far more important to everyone, is that safety betters human welfare. C. J. Hyslup, safety director for the Chatham Mfg. Co. and winner of all kinds of safety awards, expressed it in these words to this same convention last year. Speaking on the gains that management can expect from a safety program he said: "The greatest of all gains or dividends to management is the prevention of human suffering."

At the same time haven't we helped the individual? This human suffering Hyslup talks about boils down to me and you. It recalls the Safety Council's admonition: "Slow down, the life you save may be your own." Can you think of any other industrial program which carries that much personal appeal? Can you think of any other plan or project within your mill which pays such large dividends to both management and worker?

Ethically speaking I think we can all agree that human beings should come first in any industrial situation. But let's get down out of the pulpit for a minute and into an industrial manager's office. Like us he preaches that the individual is king. He likes to pay high wages and give his employees all the lush benefits that were enjoyed by most of us during the past few years. But what will happen in his mind when employee benefits bump head on into competition? If history repeats itself human personalities will take second place to competition. Any program which does not afford a profit as well as better human relations may get the ax. Let's see why.

Our country is founded on two ideals or principles. We operate under a democratic political philosophy and a capitalistic economic philosophy. To understand part of the turmoil which exists in the world today we must distinguish clearly between these two systems. As citizens in a democracy we choose our governing bodies by individual votes. We dedicate ourselves to abiding by laws passed on the principle of majority rule.

I doubt if any of us wants to change this political system in favor of what other nations have today. Although relatively young our republic has passed through enough storms to prove itself seaworthy. Our most severe critics had to take back much of what they had said when we suc-



cessfully negotiated World War II. They saw then that we were capable of efficient and concerted action in time of stress.

Today the world is being flooded with propaganda on the wonderful advantages of communism and other forms of collectivism. This pressure is particularly in Western Europe. It is not my intention to wave a red flag before you. I'll leave that to people who know more about world affairs. But I wonder if we have stopped to realize that most of the mud-slinging today is directed at capitalism—not democracy.

A short time ago some people would have us believe that the communists were the only ones who thought that present day capitalism could be improved. Then came the meeting of the World Council of Churches at Amsterdam in September. In one of their reports they had this to say: "The Christian Church should reject the ideologies of both Communism and capitalism and should seek to draw men away from the false assumption that these are the only alternatives."

Now all of us know that we cannot hope to reach perfection here on earth. The distinguished group of men who drew up this report know that. In effect what they told us is that capitalism can be improved. It's the same as having a state labor inspector tell your management that your plant's safety record could be improved. In such circumstances I have seen two different reactions. One manager gets mad, says he's doing all he can, that his employees refuse to cooperate, and that he isn't going to do any more until his employees come around. The other manager accepts the report as friendly criticism, analyzes his past mistakes, and tries to correct what he finds is wrong.

Capitalism is faced with the same alternatives. American industry can go blindly forward to another depression, or it can look at the record with an eye toward making something good a little bit better. I like this business of capitalism, and I sincerely hope we will have the sense to choose the second alternative. So let's take a look at some of the poor features of our economic structure.

In theory capitalism is dog eat dog until only one dog is left. It is survival of the fittest. It has no soul, no morals, and its only mark of value is the dollar mark. In good times this doesn't matter. When every business is making a profit capitalism can afford to be big-hearted. Management can practice its preachment that the individual comes first. But in times of stress, when sales are low and business falls off, all but the most efficient plants are driven to the level of the lowest operator.

No need to tell most of you what happened in the textile industry during the last depression. The lowest operator took the easy way out. Rather than take a chance he let people go; it was a case of individuals like me and you. It was a case of competition and the dollar coming ahead of human welfare. And it wasn't long before even those manufacturers with a sense of moral obligation were forced to follow suit. If present newspaper reports are any indication, the same thing is underway in the textile industry again.

With this kind of ammunition the communists can fire at will at our way of life. The textile industry is now spending millions of dollars each year through press and radio to tell us what a wonderful land of opportunity we live in. What good are these words to John Doe, loomfixer, who is being told that as of December 31 he no longer has a job. John has spent his life in a weave room. Through competition he proved himself best and got his job. Now he's going to lose it because the man who has been telling him capitalism is grand is not as efficient a manager as his competitor.

The great minds of American industry are beginning to realize the necessity of action which will prevent cases like that of John Doe. They know that the brutal element which would better its competitive position by means which take advantage of less fortunate individuals must be curbed. The present emphasis on competent personnel administration is certainly an indication of this awareness.

The challenge to personnel administrators is that they must find ways and means of giving capitalism a soul. It is necessary that we find processes whereby human dignity can be maintained in the face of competition. Although this challenge must be accepted, I do not contend for one minute that it is the sole province of so-called professional personnel executives. I have seen personnel programs which take a realistic



approach to the problem in mills and plants where personnel functions have never been divorced from production functions.

However, one thing was the same in each of these mills. Each one had an excellent safety program. In my opinion one reason for this is that safety is the only program yet devised which allows competition and human welfare to live together under the roof of capitalism. Whether formal or informal the approach does not matter. The aim in view must be the sole judge. And that aim or goal must take into consideration human beings as well as competition.

Then I say we had better get busy and see how we can apply the principles of a good safety program to all industrial programs. It is here that the magic formula of safety can help us. I wish I could tell you that I derived this formula by myself. I did not. It is set forth in the National Safety Council's slide film "Follow the Leader." As such it is the result of years of experience. It gives us the benefit of the thinking of some of the best brains this country has ever known. The only thing I have done is to change the wording slightly so it can be applied to any industrial situation. Here is the formula:

1. Management must be convinced that it is up to us to provide capitalism with a soul, with a sense of moral obligation to humanity. The program under consideration should be designed for the twin goal of humanity and competition. Then management must lead the way.

2. All levels of supervision should participate in policy decisions as to how the program should be run. This way may be slow, but it is sure. In the end the supervisor will carry the burden of the program, and out of his experience he can make many valuable suggestions.

3. Responsibility for the program should be assigned to an individual worthy of the assignment. If a person of poor ability can run the project it is not worthwhile and should be abandoned in the beginning.

4. An analysis of all past experience bearing on the subject should be made in order to validate the premises of the program; nothing from the past should be overlooked which will warn us of pitfalls to come.

5. The company must start by giving concrete evidence of its faith in the undertaking. This may mean spending large sums of money or using other means to provide necessary facilities. But most important management must begin to practice what it has been preaching.

6. The active participation of every worker must be inherent in the plan. Each worker, whether he understands the theory of capitalism or not, has a personal interest at stake. That premise must be proved in day-to-day activities on the job. He must participate on a proportional basis with management, and the benefits he derives must be in terms he can understand without high-pressure publicity.

7. A continuing emphasis must be assured. It is not enough to start the engine and expect it to run indefinitely without additional fuel. This is management's job.

Those are the seven parts of the magic formula in safety. They tells us why safety is your best personnel program. It is so simple it can be applied to any industrial situation, yet its implications are large enough to help us toward a better world. How well the formula is applied is up to each of us. Will you accept the challenge?



## Hazards of Toxic Chemicals

By FRANK L. OGLESBY
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In considering the impact of the multitude of chemical stimuli, with which modern man is beset, it is well to begin with the examination of the object of the attack—his body. The animal body—including man's of course—has the ability of handling certain quantities, admittedly small in instances of all kinds of toxic agents, without any evidence of injury. It does this by employing one or more mechanisms—excretion, detoxication, and isolation. By excretion, the body is able to eliminate certain

amounts of toxic substances before injury can occur. By detoxication, the harmful agent is broken down or combined with a naturally occurring metabolite so that the resulting form is less toxic or more easily excreted than the original. By isolation is meant the walling-off, or covering-over of the toxic substance in relatively inert tissue, as the deposition of lead in the bones. The sum of these activities permits the handling by the body, of a limited amount of a toxic substance in a given time without resulting injury.

In considering the action of a toxic material upon the body, two functions of the exposure must be related; (1) The concentration of the substance, and (2) the time of effective exposure to the body. It is very important that this quantitative relationship of concentration and time be understood by those concerned with the evaluation of industrial hygiene problems. The exposure which may be quite safe for one or two hours, may produce severe injury if continued for an eight hour work day. Carbon monoxide serves as an example. Four to five hundred parts per million (400-500 ppm) may be tolerated for approximately one hour without appreciable effects; but for an eight hour exposure, only one hundred parts per million (100 ppm) may be safely permitted—these values being based on normal activity.

It is well to remember that with increased exertion the volume of air taken into the lungs is greater, and therefore, the absorption rate of the toxic material. At twice normal exertion, 400-500 ppm might be safe for only a 30 minute period or so, rather than one hour. One might well suggest, therefore, that an additional factor for degree of activity be introduced into the formula, effect = concentration X time. These relationships are easily determined in the case of carbon monoxide since the carbon-monoxide-hemoglobin complex is easily and accurately measured.

It is obviously quite impractical, and fortunately quite unnecessary, to completely eliminate all possibilities of human absorption of chemicals. However, it is necessary that the exposures be limited to safe levels. In industrial hygiene control of the occupational environment, standards have been developed which are now widely accepted as the best guide for providing a safely respirable atmosphere. In the standards, the concentration of the contaminant is usually given in parts per million (for a gas or vapor), in milligrams per cubic meter (for a solid), or in particles per cubic meter (for dusts). This concept of safe exposure is usually referred to as the *maximum allowable concentration* of a contaminant in the working atmosphere, for continuous occupational exposure—that is, eight hours a day, five days a week, over a period of many years. This is a useful concept, but unfortunately has considerable limitations. Such values provide a common reference throughout the industrial hygiene field. The limitations are imposed by the uncertainties of analytical and clinical examinations.

Let us look critically at maximum allowable concentrations—at some of the limiting factors involved in their origin, and in their use. We have seen why they are established—now let us see how they are established, and used.

Superficially an MAC is a numerical value—10,100 or 1,000. Certainly, as a numerical in itself, it has no meaning. What then gives it significance—what makes it a convenient yardstick of the industrial hygienist? It is only through consideration of the factors involved in the establishment of the value, that its true worth can be assessed.

What are the practical steps by which an MAC is developed?

In the first place, the amount of contaminant in the air being breathed by the workers was determined in an actual plant situation. Samples of the air were taken for analysis—obviously these samples must be representative of the worker's exposure, if a true picture is to be obtained. Actually this is one of the most difficult phases of industrial hygiene field studies—the assurance that samples obtained are representative of actual exposure. The sampling of the general room atmosphere is not an accurate measure. In many cases, the operator's greatest exposure is localized and samples must be obtained at a point or position as near the working zone level of the operator as possible. Even when this is done, one still wishes the analysis could be made on the air actually breathed.

A further factor influencing the possibility of variation in results is the wide variety of sampling techniques, instruments,



and media. To name but a few of those in common use; the large impinger, midget impinger, electrostatic precipitator, various bubblers and absorbers, specialized instruments such as the carbon monoxide indicator or benzol indicator, and a host of others. Some were developed for specific purposes, and have since been adapted for others. For certain apparatus there is a wide choice of absorbing media—as with the impingers, large and small. With many methods, the efficiency of absorption may vary widely with operating conditions—volume of samples per unit time, absorbing media, operating voltage and other factors. Thus, even though the sample is taken at a representative site, variations in the efficiency of the sampling technique itself may markedly limit the value of the measurement.

The sample thus obtained must be analyzed—unless obtained by one of the direct reading indicators. The method of analysis may range from a very simple colorimetric test performed in the field by the addition of one or two reagents, to very complicated chemical analyses requiring considerable time and effort. Another important and frequently difficult to control variable is added, requiring the greatest of accuracy, precision and reproductability.

And finally, to correlate with the environmental factors, there must be a medical or clinical study of the effects of the exposure on workers. The form of this study and its completeness will vary widely. Some differences will be due to the use of dissimilar methods, but in many instances, a considerable variation will be found in the interpretation of results by different laboratories and medical departments. And it is upon this interpretation that the level considered safe for a worker will be based. It may appear that too great an emphasis is being placed upon the sources of error in deriving an MAC value, but unless these are fully understood, there is a real danger in attributing to the standard an accuracy and reliability which is not warranted.

As long as the conditions under which the MAC value was developed are carried along in describing the standard, the limitations of the value are apparent to the critical reader. But in time we find our MAC included in a list of values without reference to its source. It still has value for comparative purposes, but unless the background of its derivation is known, one should not place too great a reliance on its absolute value. Less emphasis should be placed upon whether exposures are a little above or below MAC values and more emphasis placed upon the interpretation of medical and clinical findings in correlation with these values.

Another source of confusion in the use of MAC values should be mentioned. Some MAC values are related to the concentration which is just below that which results in real physiologic injury—even though slight—while others are set on a "discomfort" factor, at a value below the one where any injury occurs. While both are necessary, some distinction should be made between them for the information of the user.

A practical use of MAC values is in the comparison of relative toxicities of organic solvents and other materials. Where there is a choice among several solvents, each of which may be acceptable for a job, reference to their respective MAC values, in conjunction with the consideration of relative volatilities and nature of their physiological action, will aid in selecting the one less likely to cause difficulty. For example, with the benzene homologues, benzene, toluene or xylene, the level for benzene is being constantly reduced as evidence that injury develops at levels previously considered safe, and is now at 50 ppm, instead of 100 ppm of a few years ago. Toluene and xylene are each given as 200 ppm. On the basis of MAC values alone, either toluene or xylene is much to be preferred to benzene. Consideration of the relative volatility of benzene, toluene and xylene would further indicate the desirability of substituting the latter two less volatile compounds. In many practical cases a very hazardous use of benzene has been eliminated by substituting of a less hazardous solvent.

It is difficult, even for the chemist, to visualize the relative toxicities on a "parts per million" basis—some reference factor is needed to relate the amounts of liquid solvent. This can be done by calculating the amount of liquid volume for each of the solvent MAC values for a given arbitrary space. If in a space of 1000 cu. ft., a space 10x10x 10, the amounts of the solvents shown in the test tubes were volatilized; the vapor con-



centrations, if equally distributed throughout the space, would just give the maximum allowable concentration value. For a number of solvents and other chemicals, this amount is: benzene (50 ppm) 5.1 ml.; toluene (200 ppm) 24.5 ml.; xylene (200 ppm) 28.4 ml.; gasoline (1000 ppm) 170.3 ml.; carbon tetrachloride (50 ppm) 5.6 ml.; tetrachloroethane (5 ppm) 0.6 ml.; ethylene dichloride (75 ppm) 6.8 ml.; trichloroethylene (200 ppm) 20.8 ml.; carbon disulfide (15 ppm) 1.1 ml.; styrene (200 ppm) 26.6 ml.; butadiene 1-3 (1,000 ppm) 96.4 ml.; acrylonitrile (20 ppm) 1.4 ml.; vinyl chloride (500 ppm) 39.4 ml.; acetone (1500 ppm) 127. ml.; di methyl formamide (20 ppm) 1.4 ml.

Let us consider more specifically some of the solvents; First, pointing out that while these MAC values refer to inhalation of vapor, some of the materials are readily absorbed through the skin, and care must be exercised to prevent this. For instance, the compound ethylene chlorohydrin, a solvent for cellulose acetate and a reagent in organic synthesis, is extremely toxic by skin absorption as well as by inhalation. This is by passage throughout the intact skin; not just where an injury or break in the skin has occurred. Many other compounds, among them the chlorinated hydrocarbons, are similarly hazardous. Obviously, the maintaining of an MAC value for inhalation may not help the patient if he is permitted to absorb the toxic material through the skin.

Of the solvents, the chlorinated hydrocarbons as a group are among the most hazardous in use, because of the serious nature of their effects. Their primary action is on the liver and kidney, producing hepatic and renal degeneration. This may result from either a short, heavy exposure to the vapors, or by long term exposure to lower concentrations. They are excellent solvents for a wide variety of materials, and it is unfortunate that their use must be so carefully controlled due to their toxicity.

The dangers in the use of carbon tetrachloride cannot be too strongly emphasized, particularly in view of its widespread use for such a variety of purposes. Being nonflammable, it is used frequently in small fire extinguishers. Serious or fatal poisoning has resulted from such usage in confined areas, with the high temperature decomposition products being a factor in the injury. Because of its non-flammability, and excellent solvency for greases and other impurities found in soiled clothes, it has a wide usage in laundry and home cleaning operations. The home user is under the impression that a perfectly safe cleaner is being used. Recently a radio program in our small city; a program under the sponsorship, by the way, of the local safety council, advocated the use of carbon tetrachloride for home spotting and cleaning purposes, rather than the commonly used naphtha type cleaner, and without warning the public of the very great hazard involved. The home use of carbon tetrachloride as a cleaning agent should be entirely avoided, excepting in amounts required only for occasional spot removal. All industrial use should be with adequate ventilation, controlled by field studies, and supplemented by clinical examination of exposed workers.

Ethylene dichloride has been the source of some trouble. Its use has been followed in a few instances by a psychogenic reaction to the odor. It is definitely less toxic than carbon tetrachloride but should be used with caution.

Tetrachloroethane is the most toxic of the group. In fact, its extreme toxicity has led to its virtual elimination from uses where free evaporation is possible. Serious difficulty would accompany its use in such materials as paints and cements, as a degreaser, and in practically any use in small industry or home. Tetrachloroethane is a good solvent for cellulose acetate and is used for that purpose in running viscosities on acetate dopes. Even its laboratory use must be carefully controlled.

Tri-chloroethylene is one of the most useful of the chlorinated hydrocarbons, being an excellent solvent for rubber, fats, and gums, and an efficient degreaser. Like carbon tetrachloride it is non-flammable. Its toxicity is somewhat lower than that of carbon tetrachloride. Unlike carbon tetrachloride, which usually affects the liver and kidneys, trichloroethylene exerts its action upon the central nervous system. Two hundred ppm has been considered a safe working level, with a recent suggestion for lowering that to 150 ppm.

Many of you are quite familiar with carbon disulfide, and what I have to say about it will be nothing new, since you learned long ago that it is a bad actor—one that must be kept under strict control. Its use in your field is an excellent illustration of the employment of every toxic chemical in large quantity with control of the hazard.



Carbon disulfide was important in rubber vulcanization abroad before coming into use in the textile field in this country. Considerable knowledge was gained as to what it could do if uncontrolled—knowledge of value to the young textile industry. Due to its great solvent action for fats the chemical attacked the brain and central nervous system, producing first, fairly mild symptoms of headache, irritability, fatigue, disturbed sleep, but following heavier concentrations, emotional disturbances, psychosis, and finally severe mental derangement. Some of this you learned from the experience abroad, some from bitter experience at home. You found that with concentrations of the order of 100 ppm you were quickly in trouble. That with these reduced to 40-50 ppm, you still had symptoms of mild poisoning. By keeping the exposure below 20 ppm now you find that you are out of danger—your workers have none of the symptoms of mental disturbance following these exposures. This you have accomplished by conversion to closed systems in so far as possible, the use of adequate exhaust ventilation, and to supervised control of these conditions.

May I emphasize here that such problems as this have been met and controlled by the use of good industrial hygiene procedures. Any material, however toxic, may be used if the proper precautions are exercised in its use. Where substitution of a less toxic material is not possible control must be exercised through the design of equipment and process, and application of ventilation. In too many instances, however, the need for such control measures is discovered later—after unhappy experiences of actual operation—rather than by means of prior conducted investigation. It is encouraging to note that more and more pertinent toxicological data on new chemicals is being developed *before* their use on a large scale in production.

There are many other solvents which we might consider, but time will not allow. We will but mention a few others briefly. Gasoline, as you saw from the MAC value, is of low toxicity. However, the addition of tetra ethyl lead, and other materials to high test aviation gasoline, does materially alter the toxicity. Inhalation and skin contact of these gasolines are to be avoided.

Acetone is a very important solvent with wide usage. It is about the least of organic solvents. Extremely high concentrations are required to produce any degree of narcosis, and exposures of 1000-2000 ppm. have but a mild discomforting effect upon the eyes and upper respiratory tract.

Among the gases of considerable importance, certainly from a toxicological standpoint, is hydrogen sulfide. That it is deserving of respect is certainly now well recognized in school and in industry. There have been unfortunate incidents in both—but a full realization of its really dangerous character is now more widely accepted. The fact that the sense of smell may be paralyzed thus destroying one's warning of exposure is more generally known, and fewer chances are taken that dangerous levels will be ignored.

Hydrogen sulfide in high concentrations may kill with extreme rapidity—by paralysis of the respiratory center. Lower concentrations produce first stimulation, then cessation of breathing. Experience has shown that if concentrations are kept below 20 ppm for continuous exposure, no trouble is likely to be experienced.

Of considerable importance also are the oxides of nitrogen produced by the decomposition of nitrates, by the burning of nitrocellulose, by the action of nitric acid on organic material, and in numerous other reactions. The term "oxides of nitrogen" is used generally in reference to the nitrogen dioxide—tetraoxide system. These are capable of producing severe lung irritation, giving rise to edema when the exposure is sufficient, with possible fatal results. The effects of such exposures are usually delayed, sometimes as much as twelve to twenty-four hours. In the period between exposure and onset of symptoms, rest is extremely important and may materially influence the severity of the case. Even in cases where the exposure is thought to be relatively light, it is the wise thing to take it easy until danger of severe lung



injury is past. In the order of 20-25 ppm. of nitrogen dioxide has been considered safe for continuous exposure.

The vapors of the metal carbonyls, nickel, cobalt, and iron and etc. are somewhat similar in action to the nitrogen oxides, but possibly more delayed in the onset of symptoms. Since there is little warning of their action through immediate irritation extreme care must be exercised in their use. Precautions following exposure are the same as these for the oxides of nitrogen. One ppm. has been suggested as a permissible limit.

In a subject as broad as the one assigned it is rather difficult to pick for discussion those few chemicals that the time will allow us to discuss, and at the same time select those in which you have the greatest degree of interest. When one realizes that there are some 25,000 inorganic compounds and more than 500,000 known organic compounds—one sees how hopeless is the task.

One of the most common forms of injury from chemicals is irritation of the skin—dermatitis. The diagnosis, treatment and control of occupational dermatitis provides one of the more difficult aspects of the industrial hygienist job.

Dermatitis may be defined as any inflammation of the skin. A burn, such as sunburn is a dermatitis, although we are primarily interested in those directly traceable to the action of chemicals.

Dermatitis may be classified according to the mode of action of the irritating material, as either primary irritation, or as sensitization (allergic) dermatitis. By primary irritant is meant that substance which produces inflammation in all types of skins at about the same concentration and exposure time. This is numerically the most important industrially. It may be produced by a very wide variety of substances. Some of these may require long continued contact before producing demonstrable effects, others may require but a short period. The various acids and alkalies, salts, many solvents, and a great many other compounds fall in this classification.

It was learned long ago that different types and conditions of skin have widely varying susceptibility. Light skinned individuals are usually more susceptible to primary irritants than dark skinned ones. Dry skinned individuals may encounter excessive difficulty with solvents—the action of the solvent being to further remove the fat from the skin causing cracking and inflammation. Soaps also have a defatting action upon the skin, and certain types, particularly when used excessively may prolong, or even produce a dermatitis. The skin has a pH on the acid side, and the use of soaps of high pH tend to interfere with this normal condition, and may well favor the development of a dermatitis. It is for this reason that those under treatment for a dermatitis are often taken off all soaps and placed on the use of a sulfonated oil cleanser "for the duration" and beyond.

Sensitization dermatitis is really the tough nut—the one that gives the headaches to those looking for the cause. For sensitization dermatitis is acquired through repeated contact with the causal agent. And that causal agent may be about anything under the sun—occupational or non-occupational. In many instances finding the guilty agent is truly a job of "looking for a needle in a haystack." One may be exposed to a given chemical or material for days, months, or even years and experience no difficulty. Then without warning, a beautiful dermatitis blossoms out. Unless the cause can be determined, and the exposure can be terminated, the inflammation can become severe, sometimes extremely discomforting and often disabling for a considerable time. While such a sensitization may develop to a very great number of materials, certain chemicals have been found to possess stronger sensitizing properties than others, and will sensitize a high percentage of people coming in contact with them. We are all familiar with one of these—the active principle of poison ivy. Among the chemicals falling into this class are: many dye intermediates and dyes, various photographic developers, and a number of oils. The latter may find application in the textile industry as an ingredient of lubricants.

On the control of occupational dermatitis, prevention is by far by the most important feature. Frequently the patient must be removed from the exposure until the acute symptoms and signs subside. The length of time required to effect a complete clearing may be weeks or even months, and any contact with the offending substance may cause a new flare up.

The search for the causative agent may at times be a laborious and time consuming operation. Those materials with which the patient is known to have contact are placed on the skin and allowed to remain a prescribed time, usually 24 hours. Naturally, they must not be used in concentrations sufficiently great to cause primary irritation, or a false reading will be obtained. A small pledget of cotton placed in the properly diluted liquid is fastened against the skin by adhesive. Solid particles may be held directly against the skin. The reaction of the skin to the material is then read at the time of removal, and at intervals of 24 hours up to several days. The amount of erythema or reddening of the skin and the presence or absence of vesicules or blisters is noted. The interpretation of the results is sometimes difficult; a positive reaction is not proof that the particular agent is the one causing the dermatitis. A positive reaction from a properly conducted test is merely proof that the skin in the area patch-tested is sensitive to the agent used. This and other clinical information must then be used in determining the diagnosis and future required precautions. In many instances, change of work, or even transfer from the area may be necessary.

Such conditioning chemicals used during the processing of the cloth, and so the possibility of sensitization is limited to the workers in these plants. Of greater importance, however, is the possibility of releasing to the public cloth containing a finishing material or a dye which may cause an appreciable amount of dermatitis among its users. Such situations have occurred, and may have serious consequences for the processor. The blame frequently is attached to the new fiber, whereas some other factor is responsible.

Time does not allow us a complete review of recent developments in the synthetic field. It is fortunate that many of the problems arising with the development of new products may be recognized and studies initiated for their evaluation and control, while the process is still in the laboratory or pilot plant stage. Certainly with the continued development of industrial medicine, there will be less and less excuse for failure to determine the hazardous nature of chemicals before their use reaches a large scale of production.



## Introducing a New Worker to Safety

By ROBERT BARR

**Safety Supervisor, Industrial Rayon Corporation, Painesville, Ohio**

Probably most of you have some method of handling new employees in your induction program in regard to safety. If so I am sure that you have found your safety program has improved since you augmented your regular safety work by developing a worthwhile safety indoctrination program.

I do not know whether what we do at our plant is enough, but I do know that if we don't give the new employee an insight into our safety program we may never reach him as effectively at any later date. Also when a safety matter is brought to his attention either by his foreman or a safety representative I feel quite positive that he will be in a more receptive mood for it.

There are a good many plants where a new employee's first introduction to the safety program occurs after he has been injured, caused an accident or had a "near miss." He then is shown the error of his ways and becomes acquainted with whatever safety policies are connected with his job. Undoubtedly the first question that enters that individual's mind is, "Why didn't someone tell me about this sooner?" Perhaps after having learned about "safety" the hard way, he may become a safe worker but the chances are he won't hear much more about safety until he again becomes involved in some mishap.

We all know about the companies who issue safety rule books to all new em-



ployees, along with their plant pass. They no doubt preface their remarks by stating, "Here *is* the company safety rule book, be sure to read it when you have time." How many employees do really read the booklet?

We believe that a new employee should know about safety at the outset of his employment. We want to prepare him for the hazards of his job so that when he actually gets on the job he can be on the alert for those hazards.

We feel by telling the employees about safety we are conditioning them mentally and physically for their job. Athletic teams, too, condition themselves mentally and physically before going into the first contest. Can you imagine a football team getting together for the first time on the day of the game? They have been taught fundamentals and "know how" of their jobs. They've been taught how to protect themselves and what equipment they must wear in order to avoid injury. They are shown what to do in the event of emergencies no matter what they may be. We believe that in so far as is possible new employees should be conditioned in the same manner.

The induction program may be compared to fighting a fire. In order to prevent the fire from spreading and getting out of hand, it is best to get at it at once. The same is true in safety. Don't wait until a person has worked for some time in your plant and picked up unsafe habits. It is much easier to start him off right with good work habits and have him receptive to safety suggestions from the beginning.

In order to insure continued cooperation in safety by the new employee we must be sure that those to whom he reports on the job recognize the value of safety and stress its importance. All our jobs are written up in a job procedure manual and safety is an important part of every procedure. When the instructors on the job take over we expect them to emphasize safety during the training period. We also expect foremen to continue with this practice after they take the new employee under their supervision.

Following is the program we actually use while we have the new employees under our wing on their first morning at the plant. We have what we feel is a quite complete formal induction program. This includes:

1. A complete physical examination including sight screening.
2. An explanation of why we feel an induction program necessary.
3. Giving the new employee an insight into the workings of our plant through the medium of production samples, a sound-slide film, flow charts and finally a trip through the plant.
4. A safety talk with either appropriate sound slide films or a movie on safety.
5. Information about rules and common practices at the plant, along with company policies.
6. Information about the union contract.
7. A full explanation of our insurance plan.
8. A chance to ask questions on any of the above mentioned subjects.

The safety talks and films vary with the type of new employee. If all should happen to be hired for one department with the same jobs then the talk would center on their jobs and hazards thereof. In a large plant that is a rarity, and we generally have several different departments represented and as a result a typical safety talk would be something like this:

"We want you all to know that we in this plant are interested in "safety" and safe working conditions. We know that you should be interested too for reasons which I hope to bring out in my short talk with you.

"We do not talk about safety at the outset of your employment here in order to prepare you for a hazardous job in a dangerous plant. Our plant has always had a good record, and we have maintained, since the plant started, one of the lowest industrial commission rates in all industry within the state. For comparison I will cite you the industrial commission rates of types of work which you might be familiar with. Barber shops and beauty parlors have a base rate of $.30 per $100.00 of payroll. Grocery stores $.60, department stores $.35. Our base rate for years was $.30 and on the first of July this year it was reduced to $.26.

"Even with this background, management decided to do something about safety and a program was started in November of 1945. In 1945 the company had forty-nine lost time injuries with a total of over four thousand days lost including time charges and a frequency of 11.3. In 1946 the number of lost time accidents was reduced to twenty. The days lost decreased by 50 per cent and the frequency rate dropped to 4.8. For this record we received recognition from the National Safety Council by being presented their Distinguished Service to Safety Award. We also received the U. S. Department of Labor's Safety Achievement Award.

"In 1947 we set a goal of twelve lost time accidents but through cooperative efforts on the part of everyone in the plant from top management on down we were able to get through the year with only nine lost time accidents with only 122 days lost and a frequency rate of 2.2. For again materially reducing accidents and for working 1,249,299 man hours through one stretch, we received our second Distinguished Service to Safety Award from the National Safety Council.

Some mathematical mind had figured out from our 1946 record that the average person could work a life time in our plant without sustaining a lost time injury. Since our 1947 record was twice as good, I assume one could work two life times here without a disabling injury (if anyone wants to work that long).

"Seriously, however, I am sure that none of you want to get hurt nor do any of you want to be responsible for hurting anyone else. Everyone works for one reason—to make a living. At least I have not met with anyone who works just for the love of working. Therefore, since you are working to make money in order to live, pay your bills, enjoy recreation and save something for the future, you owe it to yourself and your family to work every day and take home a full pay. You can't do that if you are disabled by a lost time injury.

"In Ohio the Industrial Commission doesn't pay compensation for the first week of disability and starting on the eighth day you get two-thirds of your income but never in excess of $25.00. For an example, let's take a man who makes $50.00 per week, during the first week he's out his entire amount and in the second week he gets $25.00 all told he lost $75.00 for missing two weeks work. Can you afford that? I don't think very many people can.

"I'm not going to discuss safety rules with you at this time. There are too many jobs represented here and you will each be instructed in safe practices and safety equipment by your job instructor. I would however like to make this comment. I believe that all safety rules could be thrown out the window if everyone would remember one thing and that is to do the job that has to be done with common sense. After all each safety rules *is nothing* more than a common sense rule.

"We are continually looking for unsafe conditions and unsafe practices throughout the plant and doing what we can to eliminate them. But I want you to remember one thing—eighty per cent of all accidents are caused by human failure. Accidents are caused by carelessness, failure to follow procedures or orders, taking short cuts, indulging in horseplay or any of a hundred other different ways. I'm telling you this because you more than anyone else can prevent injury to yourself.

"We also want you to use the dispensary. We want you to go there no matter how slight the injury is. It may only be a scratch but a scratch can become infected and cause needless pain and loss of income. There isn't a foreman in the plant who will object to your going to the dispensary. Just secure a dispensary pass from him and be well taken care of. Our nurses are on full time duty for your protection and convenience.

"To conclude this part of your induction we want you to see a film we recently secured. It's called "Miracle in Paradise Valley." There's very little in it that pertains to factory work, but the message it brings and the lessons it teaches will be remembered longer by you than anything I have said here this morning."

After the showing we comment briefly in this manner:

"Now that you have seen the film I am sure you will all agree that it really hits you where it hurts. Remember what it showed you and work and live accordingly.

"If at any time you have any suggestions about safety see me, your foreman, or your





dc; ent safety committeeman. Remember the more people we have thinking and talking about safety the fewer accidents we will have."

That ends the safety department's work on the new employees first day. We feel that we have gained a friend and we want to keep him on our side by giving him a safe job, a safe foreman, and a clean plant in happy surroundings.

All levels of supervision have been through our induction program. We wanted them to know just what we tell and show our new employees.

## A Pattern for Safety

**(An Outline)**

By D. C. DUNCAN

System Safety Director, Appalachian Electric Power Co., Bluefield, W. Va.

My purpose is to give a pattern and a blue print for organized action. In brief, we may look at the parts of the pattern as it is cut.

1. Safety salesmanship—need and value of doing the best possible selling job concerning all people and all phases of accident prevention.
2. Employing the best and most up to date visual aids.
3. Procurement, use and distribution of current safety literature, as well as established basic material.
4. Inaugurate and do constant research in field of accident prevention and its allied fields.
5. Get the new employee properly inducted and aligned with the safety work of his company, clubs and community.
6. Chart a course—have definite objectives—strive to attain them.
7. Accidents can be prevented by proper job analysis.
8. Safety meetings must be instructive, properly planned, efficiently and interestingly executed and conducted.
9. Good employee relations and enthusiastic employee participation is essential to a well rounded comprehensive accident prevention program.
10. One hundred per cent supervisory participation in the Safety Observation Plan as used by the A.T.&T. Companies, Appalachian Electric Power Company, and as recently outlined for industry by the National Safety Council is a must in a well organized accident prevention program.
11. Proper selection, use, care and maintenance of personal protective equipment.
12. Complete organization and training for fire protection.
13. First Aid an integral part of a safety program. First Aid is the hand maiden of safety.
14. Maintaining good public relations or displaying good corporate manners through the prevention of accidents to the public. Being of service to the public and serving the public interest by helping spread the message of safety through various organized agencies, service clubs, local safety organizations, etc.

The results to be obtained through the strict following of the above pattern of safety are as follows:

1. Safety becomes the first consideration.
2. Improved personnel.
3. Improved efficiency of operation and production.
4. Improved accident experience.
5. Reduced compensation and insurance rates.
6. Reduced economic loss.
7. Improved employee relations.
8. Improved public relations.

## Industrial Eye Problems in the Textile Industry

By DR. HEDWIG KUHN

Secretary, Joint Committee on Industrial Ophthalmology

The previous speaker said that there are plants in which the doctor decides as to when a fellow is all right to go back to work. We have plants in our district where the safety man decides on who goes back to work.



This is a formidable assignment first because the problems are intricate; second, because the need is great—the need of a vision program; *third*, because professional guidance is more necessary than usual; fourth, because qualified—and by that I mean experience as well as book knowledge—consultation is not too easy to get; *fifth*, because the *returns* are tremendous and no textile plant can afford to be without some type of crystal-clear, carefully-thought-out eye program.

In order to crystallize the whole thing in the beginning I will give you the several components of an overall industrial program.

First, the modern industrial eye safety program is based on a survey of eye hazards and the careful choice of eye protective equipment to match the hazard. Here a liaison between the safety man and the eye physician is of benefit to both, and without it many things bog down. Second, a modern first-aid and emergency care of eye injuries includes mostly "don'ts" which are much more important than "dos." Third, modern visual testing, tailor-made for the plant; that is the thing we are going to amplify. Fourth, determination of minimum visual standard for placement purposes. Fifth, choice of employees for apprentice training based on careful and detailed evaluation of visual requirements. And there is the gold, the return in dollars and cents. Sixth, a corrective program, worked out in close cooperation with your professional consultant.

What is a visual testing program? There are *four* types: the plant survey; that is, of payroll employees; pre-employment testing; pre-placement testing (which is different because it includes more things); and periodic re-checks.

What is the purpose? First, to acquire accurate records of visual skills of each employee. A Snellen acuity indifferently taken gives *false* security and is legally hazardous.

Second, a knowledge of basic visual skills is *really* a requirement in all industries where eyes are obviously essential to excellent production. Lay management is not qualified to decide where it is and where it is not necessary. That doesn't mean that I depreciate and do not appreciate lay management ability. It means that they cannot see that particular picture.

Third, a knowledge of the basic visual skills in plants where it is less obvious or not yet proven.

These basic skills consist, first of all, of *acuity*—that is, sharpness of vision; distance and near with and without correction; phorias—that is, muscle imbalance—how your two eyes work together; judgment of distance; and color. Those are the four things that go into a battery test for visual skills.

There is additional information required in many industries. In some of your departments, in looping, and in some of the hosiery mills, in the printing mills, in some abnormal parts assembly, there is something else required. But what I have outlined is the A-B-C for any mill in which they put things together.

Secondly, by having accurate visual data the plant can do the following: It can set minimal visual standards for a specific job. It can discover payroll employees laboring under visual difficulties. It can detect *visual difficulties* before training, and thereby place an employee where eyes fit and not reject employees—this is the "eyes for the job" concept.

The word "screening" is very bad, and I hope that you will eliminate it. It implies "screening out;" actually it "screens in." But the past reputation of the word "screening" implies a discrimination against, and if you will substitute a word like "evaluation" your industrial relations will be much better.

It is absolutely essential to realize that a basic *overall*, modern industrial eye program is the need, not one that is focused only on visual bottlenecks. The impression frequently is, especially in the textile industry, that you only need an eye program where it is obvious that you need it. It isn't that way. It is obvious where you don't realize it.

What is the instrumentation for such a program? There are several so-called battery tests. A battery test instrument is the bringing together individual tests so you can do them uniformly, rapidly, accurately, with the same illumination, and with the technician who doesn't affect your testing results by his own personal equation.



Some of the instruments are the Telebinocular made by Keystone, the Sight Screener made by American Optical, the Ortho-Rater made by Bausch & Lomb. The Welch-Allyn people, who made the Masters, now being used in eye schools, are modifying it for use in industry.

You can do the same thing with individual tests that you do with battery tests, except that they are time-consuming; they are not standardized; and they have this unevenness that individual testers introduce.

Henry Imus, of the Office of Naval Research has, through the last two years, made a painstaking analysis of these instruments as instruments, validating the individual tests, indicating which is more valid than the other. That has been published in "Transactions," the publication of the American Academy of Ophthalmology and Laryngology. It is being published in several magazines in the next few months.

All three battery test instruments are valuable. All are sufficiently accurate for their specific purpose in the industry, except, perhaps, the test for color, which is never satisfactory. In fact, there are very few tests, even in the single, individual tests, at this time, that are satisfactory. Where color appreciation is important (and that is true in some of the textile mills where color is used and where color codes are followed), then supplementary tests are indicated, such as Farnsworth's dichromatous test and for even more discrimination, Farnsworth's 100 Hue Test. These are not tests that you can put in a battery series or do quickly. They require very painstaking attention. However, the instrument is only a vehicle for a sound program, and *it is the program that produces results.*

You can have an instrument and have no program and no follow-through on it, and you have nothing. The same tests, properly administered and carried through as part of a program will produce a banner in your company or a gold star on your record.

Of what does the program consist? First, a choice of your testing technique—whether it is battery tests, individual tests, or a combination. Second, an analysis of the records. This can be in the plant. Western Electric has a large statistical staff. They do all their analyzing, minimum job requirements, studying, and research in the plant. Or, you can have it by consultation service, such as Purdue University offers. Do not get amateurs to analyze your record.

The research has been done. The facilities are available for consultation service, if you want it. Your analysis of Records should go farther and be scrutinized by your professional consultant.

That particular part of your analysis of your records is important. It adds that something which cold figures do not give you. Your program incorporates the setting of minimum visual standards by this analysis, plus this review, and then it makes sense to industry.

Very important in your program is the choice of whom you are going to refer to for corrective procedure. Here you need to work with your professional consultant to avoid tangles, reverberations, and boomerangs. This plant guidance, does not mean that cases cannot be referred to their physician or doctor of choice. It just means that you have one person helping you to formulate your program.

Ninety per cent, or more, of the referrals are, or should be, for the present, on the basis of acuity defects, either distance or near. That is the one safe thing to send out, because everybody can do something with it. But send them, if they go out, with a job description—measurements of distance from the eyes that their work is; whether it varies; whether one day they do this or that, and what they do the other day. An employee cannot carry an accurate picture of his job to the man who makes his glasses.

Your muscle imbalance referrals depend entirely on whether there is ethical, acceptable, and qualified orthoptic training facilities in your specific community. It is delicate and difficult to define who is or is not qualified.

The person with near-vision muscle imbalance problems is in real trouble, and he can profit greatly by orthoptic training. You want to be sure there are or aren't facilities for such training. Such training can really be a racket. There are more colored gadgets called "training" for muscle imbalance than there are qualified programs.

Stereopsis, or depth perception, if it is correctible at all, is correctible through correcting the refraction and/or muscle imbalance problems. You who have no depth perception—everything else being normal—are stuck; you can't acquire it; you can't train yourself to get it. If you have no depth perception, or if it is low, because your eyes don't work together, you can be trained to have a better degree of depth perception. But if the fellow has none, all the training in the world will not give it to him. The same is true of color. You either have it, or you don't have it.



Now, what do you do with the record of an employee's visual skills, assuming that it is accurate? This forms the basis of progressive management-employee joint efforts toward increased production, decreased waste, improved public relations, altered and better results in human engineering. This particular angle needs much more consideration by management, especially in these days when unions are asking for services and protection from all phases of physical decapacities. By having the confidence of the employee in safeguarding his eyes and his visual skills, we have the key to a much closer contact.

Your record enables you to discover the people who are in trouble visually. In one of our plants, a man meeting all the visual standards did not realize he had trouble but the professionally-adjusted record sheet indicated he was refracted and did have trouble. The trouble was corrected, and he came back to management and said, "you know when I used to go home to my wife I wouldn't go anywhere at night. I couldn't go to the movies. I had a headache; I was tired; I was tense; I was griping all the time; I wouldn't go out to see people. Now I can, since I had my glasses."

The reason for his trouble was the terrific effort he made on the job. He did top work, and he used up everything he had in nervous tension, so that by the time he reached home he didn't have anything left.

Your record provides information necessary to direct people into proper channels for correction; without it, you are in a haze; you don't know.

Your corrective program is actually the greatest contribution, with one exception, made by the visual testing program in your type of industry. The exception is the dollars-and-cents value to industry where expensive and lengthy apprenticeship training is necessary. Four or five years training of a man who is going into the color department, or the fine quality departments of a printing industry, for instance, is expensive if you find out, after his third year, that you have to wash him out. That is why the aviation tests were so very, very rigid.

Now for a few more problems. Companies often do not visualize the tangible returns in dollars and cents unless presented with reported experiences and cold facts, of which there are now many available.

Secondly, management often has a complete lack of understanding of what constitutes a modern program of industrial medicine. They feel that it should be curative, first aid—take care of the fellow who has fallen into the acid bath. Actually, it is preventive, and this visual program forms part of it.

The contention that a visual program is is applicable only to certain types of jobs and operations is a fallacy and an assumption. It is already known that accident correlations are difficult. You can't use those as your first criteria. There are too many things that enter into that picture. The careful experiments in California on traffic accidents, where they got all through and found there were no correlations is an instance of this.

Somebody said, "Well, did anybody make a record of which eye was bad, and which side the fellow was hit from?" No, they didn't. It threw the whole thing out. You can't have a correlation with vision unless you have all of the facts.

The very uneveness of reporting is a problem. Cliff Boughner's story is an interesting one in this regard. He is dead now, but when he was in the Gary Mills, he used to go out immediately after an accident and test the vision of everybody involved, including the witnesses. You have known of witnesses of all kinds of accidents, murders and holdups. If their color is off, they can get the person's hair wrong or they can get the color of the car wrong. If their vision is down, their reports in court are discounted accordingly, because they can't see what they actually look at when they report.

Again, the assumption that near vision means 14 inches or less, and that work done farther away does not belong in the category of visual problems is fallacious. Your greatest problem, especially among men from 40 up, is with the people who work



at arm's length. Your problem comes in when *they* are wearing bifocals.

Very often you have a lack of realization of what muscle imbalance and stereopsis are for near vision. You figure it applies only to the fellow who is operating a crane or a truck or something like that, but you *try* to thread something through a hole and your eyes won't line up, and it gets fuzzy because of that and nothing else. Near muscle imbalances and depth perception for close application are important in the picture.

One of the main reasons for this unawareness is that the lay staff are unable—not through intent but through lack of training—to recognize this. In order to tie that up, you should bring your consultant into the plant; and take him through all the job operations from A to Z. Then take him out and play the 19th hole with him. You will really have a program as a result.

Your loopers, of course, are very vital; and I want to correct something that Dr. Kephart implied through the title of an article in the *May* issue of your "Textile World." The article implies that standards have to be different for all the plants for *the same job.*

That isn't what he meant. There is a basic visual standard for each job operation. That *does not vary.* But in this town your workers may be of a lower physical stamina, undernourished, or *something of the sort,* so that you would have to exclude everybody in order to meet that standard. The standard still stays, but you admit people that don't meet the standard. After you have admitted them, "screened" them, tested them and corrected them, you find they will meet that regular basic standard.

Our experience in a hosiery plant is interesting because it points at my own profession. This company had chosen an eye doctor for their loopers. They knew they had a problem. He tested the eyes of 200 girls in his office. Most of them were nearsighted. He gave them full correction and told them to go back to their job.

The nearsighted person who has never worn glasses who is told that he must wear them all the time for close work (8 inches) really goes into a tailspin. So, that plant, instead of being better off, was worse off, and it was because they neither asked the doctor nor did the doctor offer to go into this problem to see what they were doing.

That is illustrated in the chart in Joe Tiffin's book, where, after we went through the whole thing again, we were able, by occupational lenses, prisms, and magnification, to increase production.

I promised to call everyone's attention to the "Wise Owl Club, and I hope you go down to the National Society for the Prevention of Blindness and see this wonderful new idea, which is similar to the Caterpillar Club—the people who had to bail out from a plane. Little pins, with small emblems, are given to the fellow when he has had his eye saved by safety glasses. The pin has no symbols on it; that forces the person who sees it to say, "*What is it?*" That spreads the education that is the goal of the Club.

## Standard Method of Injury Reporting

By GENE MILLER
Senior Statistician, National Safety Council

Injury reporting and the determination of injury rates is an after-the-fact component of a safety program. Still it is a very important part of a program and should be given consideration in this discussion of safety work and safety objectives.

The Standard Method of Injury Reporting on American Standard Association Code, does not change but questions are constantly arising; and it is helpful to have a general discussion of the subject occasionally to clarify any questions or interpretations of the Code.

I have had safety men say to me that they don't keep accident records, but that if I can ever show them a statistic that stopped an accident, they will keep them. There is some truth in that statement, of



course. Accident records, as such, will not stop accidents—but they must be given consideration because they are an essential component of a complete accident prevention program.

Many safety men feel that they are keeping these accident records just for the National Safety Council. Just the other day a company in one of our contests wrote in and inquired about the kind of an award they were going to get for having the splendid rate of 2.06, in our Metals Section Contest. Out of a group of some 50 companies they ranked fourth, which certainly was a splendid achievement, but because they did not rank in the first three places, and because they did not participate in the previous year's contest (which is a requirement for getting a reduction award), there just wasn't any award available for that record, as good as it was.

After I told the man this, his reply was that he didn't see any reason for all the time and effort he had put into keeping those records, as if the only purpose was for the contest, overlooking the fact that record-keeping is only an end product. We don't work all year long just for the records. We work all year long to reduce injuries, and the end product is the injury rate.

Injury rates have their purposes. They are used, as you know, for determining trends within an organization, for making comparisons from year to year, and for making comparisons with the industry as a whole. They are also used as a method of evaluating plants which are participating in various safety contests.

As you can appreciate, all this requires the use of a standard method. It would not suffice for each company to keep records in its own particular manner. Each company has to keep the same kinds of records and include in those records the same kinds of injuries; otherwise, the resulting rates would not lend themselves to comparison. It really isn't important what kind of injuries are included in the rates as long as everybody is including the same kind.

As an example of the difficulty which is encountered when rates are not kept on a comparable basis, about a year ago a large department store right here in Chicago inquired of the National Safety Council about the kind of a program that we could give them, and what they might expect out of it.

Our staff representative for that particular type of industry discussed with the safety director what we could do for them, and what they might expect out of our services. In the course of discussion, the subject of his injury frequency rate came up, and he said it was around 1.5.

We showed him the kind of services we could give him, but we told him, quite frankly, that there probably would be very little that we could do to reduce an injury rate already as low as 1.5.

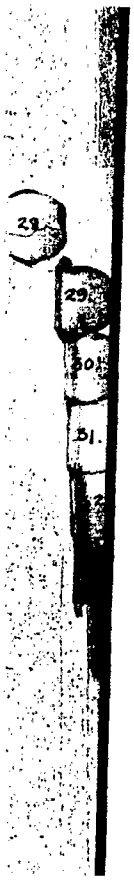
Recently I was informed that following a change in personnel there, and as a result of using some of our services, they became better acquainted with exactly what should be included in the injury rate, and as a result, the rate of that organization was not really 1.5, but something around 15. So, you can see how the rate he was using failed to disclose the conditions which were really present in his plant.

Not so long ago I had a letter and a number of reports from a large textile company. The safety director asked me if I would look over the reports and see what I could find in them. Would I please interpret them for him?

The first thing that impressed me was that he had a very high rate, somewhere around 50. But on examining the material further, I found that he was including in his rate not only disabling injuries but also less serious injuries.

Because of the kinds of injuries being included in the rate, it was not possible for me to tell whether it was better than industry as a whole, or whether he was showing improvement, or whether the trend was in the reverse direction, because he was not determining his rate by the standard method.

In a number of instances, injuries included in rates are still influenced by particular state laws, and as you know, the compensation requirements of various states are almost as varied as there are numbers of states. If the compensation commission happens to be particularly lenient in one state, or has a surplus in its fund, it might declare injuries compensable which would not be determined compensable in another state. As a result of this difference, the injury rates



of plants in various states would not be comparable.

We found such a situation to exist in one large meat-packing company which had a number of plants scattered over various different states. The safety director was particularly perturbed over the fact that the records of the various plants could not be compared directly, and when I suggested to him that they use a standard method, he said he didn't think it would work. But he is using it now, and he is very satisfied with it because it gives him exactly what he wants. He can now compare the experience of all of his various plants and make direct comparisons. He can tell exactly how each plant is progressing in comparison with the other because the plants are no longer including in their injury rates just the injuries which are determined to be compensable in those states, but instead all of the plants are including the same kinds of cases.

I have emphasized the importance of including in a rate only injuries which are determined in accordance with the standard method, and the question might arise, "Why not include all injuries instead of limiting it to certain types of injuries?" You cannot go right down the line and accept every injury that occurs in a plant, because as you progress towards the more minor injuries you finally get to a point where the injuries are so minor that it would be impossible to obtain agreement on their reportability. Questions would arise on how serious a scratch has to be to be included, and as you continue to accept the less serious injuries, you finally get down to a point where you're making decisions on pinpricks.

To get comparability in reporting, there has to be a definite stopping place, and one purpose of the standard method is to set such a place, which necessarily has to be well above the minor type of injury. Types of injuries which should be used in computing injury rates by the standard method include: deaths, permanent totals, permanent partials, and temporary total disabilities.

Deaths, of course, need little discussion, except that, regardless of when a death occurs, it will be included if the injury arose out of and in the course of employment.

Permanent total disabilities include such injuries as loss of two eyes or two hands or two legs—injuries of the type which totally and permanently incapacitate the employee for further gainful occupation.

Permanent partial disabilities are injuries which permanently handicap a worker, but do not completely incapacitate him, like the loss of a finger.

The fourth type of injury which is included, and which is the very controversial type, is the temporary total disability—an injury which is only temporary in nature, but which totally incapacitates the worker for at least one day. These are the four classes of injuries which should be included in the injury rates.

(There are two other classes of injuries—temporary partial injuries, and first-aid cases, neither of which should be included in computing injury rates.)

To be reportable, an injury must arise out of and in the course of employment, and be sufficiently serious to prevent the injured employee from returning to his own job, or another regularly-established job in the plant, which is open and available to him, within 24 hours of the end of the shift on which he was injured.

Because of such factors as the plant not operating on the day following the day on which an employee was injured, because it is a holiday, a Sunday, or some other non-work day, it is necessary to put in the 24-hour clause. If this clause was not included, then injuries which occurred on Friday and which permitted the employee to come to work on Monday, would not be counted; whereas, the same type of injury might be counted if it occurred on Monday and the worker could not get back to work until Wednesday.

In the standard method, emphasis is placed on ability to work. The Code states that the injured employee must be able to return to work within 24 hours of the end of the shift on which he was injured. The reason for the emphasis on the word "ability" is to prevent a company from being penalized should the injured employee decide to stay home on the following day, even though the injury itself was not sufficiently serious to cause that. If the injured employee is *able* to work on the following day, the injury should not be counted.

The standard method is completely divorced from state compensation laws. Each injury will be judged on the basis of the particular circumstances and will not be influenced to any extent by the compensability of the injury in the particular state in which it occurred. In doubtful cases, the opinion of the attending physican is obtained to decide whether or not the case should be reportable, because it is felt that in general, medical opinion will be more uniform than state compensation laws.



Another part of the Code which requires a little additional explanation refers to that term, "*another regularly-established job*," because it says that even though the injured employee cannot return to his own job, if he can return to another regularly-established job in the plant, then the case need not be charged.

This other job, though, must be one that is regularly set up on the payroll, and during the time that the person is injured, that particular job is not filled but is open and available to him. If the injured employee is not able to return to his job, but he can do the work required in another regularly-established job, the case is not reportable.

The Standard Method of Injury Reporting is referred to as the American Standards Association Code, and it has relatively little to do with the National Safety Council. The Code was not established or determined by the National Safety Council. It was set up by the American Standards Association, which is the same association which standardizes weights and measures, threads of screws, and all other items and elements of our economy which are standardized.

The Code set up by this association was determined only after careful and measured consideration of safety representatives of all types of businesses, organizations, and agencies.

A few of the organizations which are included among those who determined the Code are the American Iron & Steel Institute, American Gas Association, American Statistical Association, Association of American Railroads, and the ICC. There are any number of insurance companies and various state labor departments, including the Ontario Workmen's Compensation Board, which makes it international in scope. The Navy and War Departments also are on the list, as well as the National Safety Council.

Representatives of these organizations are persons who have had many years of experience with safety work, injury reporting, and record keeping. The Code is really established by operating personnel, who have to use the Code.

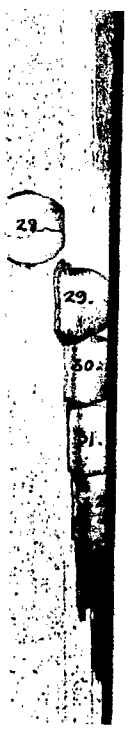
I have emphasized that in using the standard method, injuries of only a certain seriousness will be included, and the purpose of this, as I pointed out, is to obtain comparability with other companies, with the record of your own company in previous years, and with the records of other industries. But as you can readily appreciate, excluded from the determination of injury rates are many less serious injuries. Does that mean that the less serious are not considered to be sufficiently important to be given any attention? Of course, the answer is, "No, they should be given attention." They are excluded from the Code only because it is difficult to obtain uniformity on these various other injuries, but each company is urged to give adequate consideration to all of these minor injuries, to study them and analyze them, to find out how and why they happened and take the necessary steps to reduce their occurrence.

Even with the Standard Method there are many cases in which it is difficult to decide whether or not they should be included. For that reason, included as part of the Code is a provision that a committee of judges shall be set up to adjudicate questionable cases.

If a situation arises in which it is difficult to decide whether or not the case should be included in your injury reporting, first we at the Council will be glad to give our opinion on the case and interpret the Code as it applies in that particular situation. If we find that the case is still very much a borderline situation, or if we render a decision and you feel that we have probably not taken into consideration all elements of the Code, then the case may be referred to this special committee of judges, which will take a vote and decide whether or not it should be included.

There are certain kinds of injuries which are particularly difficult to interpret. One of these injuries is the hernia. It is often very difficult to determine whether or not a hernia actually resulted from the employee's work, or whether it was congenital in nature.

So, to facilitate the determination of such cases from the standpoint of reporting, the Code has included in it certain requirements



which must be satisfied for a hernia to be considered an industrial injury.

One requirement is that there must be a clear history of an accident. In other words, if a man comes along and says, "About a week ago I think I strained myself when I was lifting this or that," such a case would not be considered reportable because there is no clear history of an accident. Another point is that there must be severe pain in the hernia region at the time of the accident. The third point is that the pain must be sufficiently severe that the employee is forced to stop work, even though momentarily.

All of this, you see, is designed to insure that the hernia actually arose out of the course of employment and was not inherent in nature.

Another type of injury which we have found causes some difficulty in interpretation are cases like dermatitis and bursitis, where there is no definite incident or accident which causes the disability. If these ailments arise in the course of employment and are a result of an employee's work, they should be counted, provided that the limitations on time are satisfied.

MR. W. A. HAHN [The Graniteville Company, Graniteville, South Carolina]: Can hernias be accepted for humanitarian reasons and still not be counted in our frequency rate?

Let's say a man has been hurt in the course of his work, but he does not fulfill any of the requirements of the rules; yet, we feel that it is good human relations to go ahead and accept his claim. Does that have to be charged to our frequency figure?

MR. MILLER: No. For a hernia to be charged, it would have to satisfy the three specific requirements. If a company decides, for morale purposes, to compensate the employee, that would be strictly a company policy. We are trying to get uniformity in reporting these cases so we want everybody to report the same way.

MR. HAHN: We had a death that occurred because of an infection. The circumstances are very doubtful, but for public relations purposes, management has accepted the death and are going to settle according to state law. Yet, there is no way to establish that the person did die as the result of an infection that he incurred, because he refused, repeatedly, to report to our physician, after being requested to. He was off the job, and he claimed that he was hurt and infected; he was asked to see the doctor and did not. That happened several different times. Eventually he died. Before he died, he said he was sick because of an infection that he never did report. We doubt it. But management, for human public relations has accepted it, to settle.

Now, should we charge that up to our frequency rate?

MR. MILLER: There would have to be definite evidence that the injury, no matter how slight it was in the original instance, did occur on the job and arose out of the work. In the absence of that information, the case would not have to be charged.

MR. ARTHUR KINSMAN [Kinsman Worsted Mills, Rhode Island]: You say it is all right if a fellow comes back to an established job, even though it is not his own job. Does that mean that a man can come back into another department where he can do a regularly-established job, even though it is foreign to his actual department or the work that he had been doing? Would that not be considered lost time?

MR. MILLER: The Code says if he is able to return to work and fulfill all the requirements of a regularly-established job, the case would not be counted. The available job is not restricted to the department in which the man was injured.

MR. SNODGRASS: In that case, if you have a plant that is not unionized, and you say you have a man injured in the spinning division, but you move him over to the textiles for a day, on an established job there—it doesn't look like that would be fair to a plant like ours since we are unionized and can't do that.

MR. MILLER: I would say the other job was not open and available to him.

MR. SNODGRASS: But I can't compete with some company that permits this. Maybe a man scratches his finger; he may be working in an acid bath and is not able to work on his regular job—we go by what the doctor says, and the doctor says he has to be taken off that job—if we could move him over our record would be good.

MR. MILLER: Wouldn't the limitations placed by the union on these other jobs operate quite uniformly throughout the entire industry?



MR. SNODGRASS: Not necessarily because some of the plants are not unionized to the extent that we are unionized.

MR. MILLER: I can see in a case like that where it would be operating to your disadvantage, but at the moment I can't see any way that it could be circumvented.

LIEUTENANT KENNY [Bureau of Medicine and Surgery, United States Navy]: The question was brought up about a punch-press operator who slips on an icy pavement coming in the gate. Who is charged for the injury?

MR. MILLER: An injury occurring under these circumstances should be charged to the overall plant record without being charged to any specific department.

LIEUTENANT KENNY: Has a time charge been set up for hernia, or should you charge only the number of days he is absent from work?

MR. MILLER: All hernias are charged 50 days, regardless of the number of days the worker actually loses. If a hernia can be repaired, its is classified as a temporary total injury, but if it cannot be repaired, it is classified as a permanent total injury. In either case, 50 days lost time are charged.

MR. C. J. HYSLUP [Chatham Manufacturing Co.]: Workers suffering hernia injuries are now coming back in three or four weeks. Are we still charged 50 days?

MR. MILLER: Yes; that is the present standard method.

## Getting Results from Safety Incentives

**(Panel Discussion)**

*Chairman:* H. E. WILLIAMS, Safety Engineer, Fieldcrest Mills, Division of Marshall Field & Company, Inc., Spray, N. C.

*Participants:*

ROBERT M. MURRAY, Chief of Inspection, Department of Labor, Rhode Island.

J. FRANK HAY, Safety and Training Director, Rocky Mount Mills, Rocky Mount, N. C.

MR. ROBERT M. MURRAY: Nearly every state has some division or bureau which is charged with at least partial responsibility for the safety and health of the workers employed in that state.

When the various states were passing workmen's compensation legislation requiring the safeguarding of certain specific machines and equipment, the thought was to secure correction through laws enforced by inspectors armed with police power.

The present trend, however, is to substitute education for enforcement. This is based on the fact that if both the employee and the employer fully realized that accidents do create a preventable loss to both of them, they would both take action for their elimination.

This does not mean that we should do away with enforcement, because I think we all know that there are a small number of plants who will not meet even minimum requirements unless they are forced to do so.

In my position as Chief of the Division of Industrial Inspection, I received many requests from various men who are starting in the safety field with regard to a type of incentive that could be applied in a particular plant. I have to advise them that I have no definite pattern—nor can I suggest a definite pattern for the particular plant until I know something about the plant. One incentive might work satisfactorily in one plant and not in the other plant.

We know that creating and maintaining interest applies to employers as well as to employees. Keeping guards in place is one of the many phases of industrial accident prevention in which the work of creating and maintaining interest is a vital factor.

Even more important is the part which foremen and employees play as members of the safety committee, or leaders in safety meetings, in accident investigation, in finding and reporting unsafe practices and conditions.

The necessity for individual interest and the methods of creating and maintaining it



are fundamental to all phases of industrial safety. The interest of individuals may be aroused and maintained by making use of what we call "known" incentives.

With human nature what it is, many of us are desirous of financial or other forms of material or personal gain. It is often true, therefore, that interest in safety may be created if associated with a reward of some kind in recognition of some outstanding *performance in safety*. There are many ways that this can be accomplished, such as bonuses, personal gifts, banquets, picnics, and so forth.

A textile mill was experiencing difficulty in getting quills picked up from the floor when they were thrown out of the loom. Five dollars a day was taken from the petty cash, and slips of paper were printed with amounts ranging from 10 to 50 cents, and rolled up and inserted in the edge of the quills.

One of the overseers then took perhaps two dozen or so of these prepared quills, and without being noticed, dropped them on the floor in various parts of the room. A few employees were then told that each day it would be possible to find quills with cash awards in them.

The result was that whenever an employee saw a quill on the floor, he picked it up to see if it contained one of the awards. If not, the quill was generally placed in the quill box, and within a short period of time, on the first day, all the money had been found, and the quills picked up.

This idea was used for more than a month, omitting it on certain days to see if the employees continued to pick up the quills. After some time its effectiveness diminished, but it did bring about a much better housekeeping condition.

The textile industry, I believe, has used recognition awards very generally. These awards have included such things as banners, flags, certificates, plaques, and letters of commendation. *From my* experience, such incentives are not always received too enthusiastically by the employee, who *is naturally* concerned primarily with the recognition he, as an individual, receives, rather than recognition of the department.

A large textile plant employs about 2,900 workers and works approximately 7,000,000 man hours annually. This plant has had an excellent accident record over a long period of time. Previous to Lend-Lease it had not experienced any great turnover in the labor force, but Lend-Lease changed this. With the turnover, an upward trend of accidents was noticed in the plant.

It was decided that something should be done to create a more active interest in safety among the foremen, as this plant was a staunch believer in the idea that the responsibility for accident prevention rests with management.

The system devised was a quarterly contest for foremen. The following money prizes were offered: $10.00 for each foreman who had no accidents; $10.00 for the foreman having the best record of penalty points per worker; $10.00 for the foreman whose record shows the best improvement in penalty points over the same period in the previous year. In case of a tie, the award was divided proportionately.

Any foreman with fewer than 10 employees was not eligible to compete.

For the purpose of the contest, penalty charges were made as follows: there were 318 points charged for a major accident, that is, one that prevented the injured employee from returning to work on his next regular shift; 38 points were charged for a sub-major accident—one that resulted in no lost time, but the injured received special medical treatment.

There was also one point charged for what was known as a minor, M-1 accident, a slight cut or scratch.

One point is charged for a minor M-2 accident, defined as a laceration, a bruise, a strain, and so forth.

To determine the penalty points per worker, the penalty points are divided by the number of workers. For example, Foreman A was charged during the quarter with 10 penalty points. He had 28 workers. Dividing the penalty points by the number of workers, you get .36 penalty points per worker.

At the end of each quarter, each foreman makes out a report of the number of accidents reported by employees under his supervision, major, sub-major, and minor. This report is forwarded to the safety director.

The safety director then checks that report with the records of the first-aid department. The safety director then tabulates the results, and a copy is sent to each foreman.

Here is an incentive system that has produced results. With the tremendous labor turnover in the plant during the past 10 years, this firm has operated with an accident frequency average of 3.5, and in no year during the period has the frequency exceeded this figure.

Contests have proved widely successful in stimulating interest in safety as between departments, among various plants, and on a local and state level.

In addition to grand prizes or awards, some contests provide other incentives for immediate successes. Trophies and plaques appeal to management, for example, as these items have good value for community publicity, whereas cash awards, pins, merchandise prizes appeal to the employee. Some companies that have started suggestion systems solely for their value in good will have continued support of such systems with full awareness of the profit to be derived from them.

A gentleman told me that in 1947, his plant had *paid out*, in direct cost, $15,200 in compensation—medical, hospitalization, and so forth. For the first nine months of this year, they have only paid out $750.00. And his management had told him that if they could operate at a 50 per cent reduction in cost over last year—50 per cent—that they would take the entire plant out to a dinner. Again, we have an incentive system that we must recognize.

MR. J. FRANK HAY: I am not going to tell you what our frequency rate was for 1945, but it was tremendous. In 1946, our frequency rate was 16.26. In 1947, it was 10. And in 1948, at then end of June 30th, it was 2.7. We feel a great deal of this reduction is due to the use of safety incentives.

Of course, we put on guards, and we used posters. But I believe that the main factor was this simple contest that I shall describe.

We have our contest set up with a grand prize to the department with the best record. In each department, each shift has a committee of workers, not foremen. We have a first, second, and third prize in each department.

In addition to these, in this past year we offered a prize of a $25.00 bond to every committee member, if there was no lost time through accidents in the plant. Even one lost-time accident would cancel this offer.

It is not enough, however, to give a few bonds or a few prizes, even though I do think that a prize is much better than a *cash* award.

It is important to emphasize the prestige of being a committee member. You single the worker out to appear on a committee. He goes to weekly safety meetings in his department, and it builds his sense of prestige. One department even has an election to elect members for the committee; and we get new committee members each year. Sometimes they are merely selected by the foreman or supervisor. But this prestige really helps a great deal.

As I said, our contest had this offer of the $25.00 bond if no accidents occurred. We had a lost-time accident. We went through the plant contacting the various committee members and talking to them about this particular accident, and I was quite surprised at their reaction. They didn't give a darn about the $25.00 war bond. What they were worried about was that they might lose the chance of going to the dinner that we always have at the end of the contest.

CHAIRMAN WILLIAMS: Are there any questions.

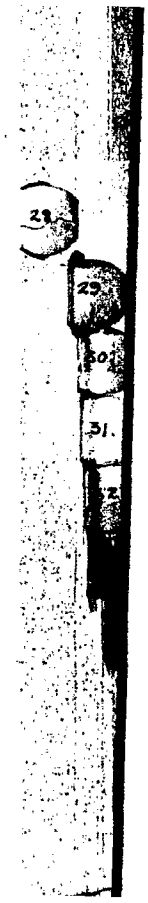
MR. JOHN BURGER [W. J. Dickey Company]: What if Department B has half the number of employees of Department A, and therefore, only half as many hours of exposure—and both have a zero frequency rate. Which department is the ultimate winner?

MR. MURRAY: It is general practice to give it to the department with the highest number of man hours. We do that, even in our state safety contests. I mean, if there happens to be a tie in frequency, the one with the highest number of man hours receives the award.

MR. BURGER: I have a silimar situation, and the small department says, "If we go along for a hundred years and don't have a lost-time accident, we'll never win the plaque." So, they claim they have two strikes on them. What are we going to do for them?

MR. MURRAY: If you say that the one who has the best record is the winner, you





must recognize the fact that the one with the largest number of man hours has the best record. I realize that it is unfortunate because in that small department they may have done a perfect job, but assuming that the other department has operated say twice as many hours and is showing a frequency rate of zero, I still believe we must recognize the fact that they do have the best record.

MR. BURGER: There is a psychological factor involved there. Department B, with half the number of employees, after a few years, will say, "What's the use? We have zero; everybody is on the ball; we don't get anything." I think they should be rewarded in some way.

MR. MURRAY: When you plan your contest, you could make it definite, either that in case of a tie, the one that has the highest man hours would win; or that in case any department has zero frequency, they would be entitled to something.

MR. ABBOTT SMITH [The American Viscose Company]: We just started in our company on a contest. We don't attempt to rate the highest department on the basis of anything other than what we are trying to do, which is to keep people from getting hurt.

We broke them down into individuals, into what we call "natural units," and we called them "legs," because everyone knows what a leg is. In the spinning room, where we run continuously, we have four shifts; so, those four shifts compete against themselves. They are doing identically the same thing, under the same circumstances, under the same department heads—the foreman, of course, are different, but the department heads are the same.

Then we say to that group, "The group (we will call it Shift A), if Shift A has the best safety record, that group can elect one of their men to get an award." They elect the man. We break it down into that single unit because we don't give one darn about whether we give one gold watch or 700.

We have a mill with 2,000 or 3,000 people in it, and if you can run a mill without any lost-time accidents, brother, gold watches are very cheap.

In your crafts you do the same thing there. You let the carpenters stand on their own. If the carpenters do not have any accidents, they get a dinner, and then they elect one of their group who has done the most to contribute to the safety record of that unit.

MR. MURRAY: You mentioned that you have the three shifts or four shifts compete for the best record. Is there a possibility of having a smaller number of employees on any one of the shifts than is on the others?

MR. SMITH: There would be some variation, but very, very little because they are doing the same thing.

MR. MURRAY: Let's assume there would be five exposure hours difference; who would be the winner?

MR. SMITH: If they all had a perfect frequency, they would all get the prize.

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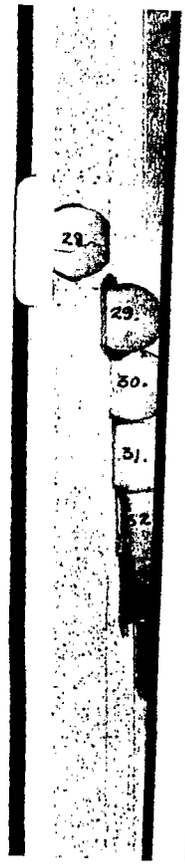
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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

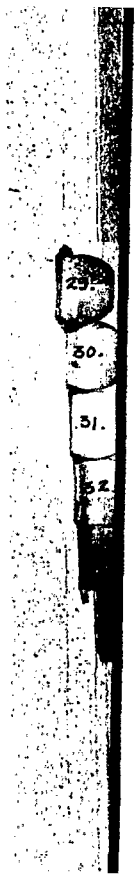
Because of this fact, safety leaders throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to key individuals at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE TRAFFIC SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Traffic Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Traffic Section carries on in behalf of its members, and for the benefit of accident prevention work in public safety generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in day-to-day safety programs. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on page 163 of this volume.



# Uniform Enforcement

By MAXWELL HALSEY
Executive Secretary, State Safety Commission, Lansing, Mich.

The law enforcement, traffic and safety and safety council officials of Michigan have undertaken to pioneer some new traffic accident prevention methods, procedures and systems.

It is the function of the author of this presentation to report on their behalf the progress that has been made and to refer particularly to those parts of the program that have a direct bearing on the subject of uniform enforcement.

In the year 1944 the Michigan group, having believed for some time that the public was being confused by various cities conducting non-related programs, decided to develop a series of special emphasis programs in which all communities and all groups interested in safety could participate simultaneously.

The first subject selected dealt with "Brakes" because this would not only help reduce traffic accidents but could also serve to encourage motorists to have their equipment repaired—an important item in view of the war-time transportation situation.

Thus there was launched the first state-wide action program in which 99 communities participated. Twelve associations and groups participated and 1,000,000 leaflets and 30,000 posters were distributed. This was followed by the second state-wide emphasis program on pedestrian safety.

These two marked the beginning of a pattern which was enthusiastically received. There were requests for six or more of these per year.

The first two Michigan programs resulted in the adoption of the National Brake Check Program which was carried out a second time on a national basis under the title of the Nation-Wide Brake Emphasis Program For Traffic Safety.

These were the forerunners of the present "Operation Safety" program which utilizes the identical principles and expands the number of subjects or themes from 6 to 12 per year.

It should be noted that the basic reason behind this Michigan development was uniformity of programs to replace non-related programs carried on simultaneously in different communities.

The more this general idea was explored the more it was realized that while public-support themes were effective, it was even more important to apply the idea to the fundamental actions of police departments and courts.

In other words, it was all very well to develop an operation which would get more public support for an enforcement action, but that it was equally important, if not actually more important, to improve the enforcement actions themselves which the public were being asked to support. If the public were to be asked to support traffic law enforcement more strongly in the future and if enforcement activities were to be stepped up as more support developed, then the public had a right to expect an improvement in the quality as well as the quantity of the enforcement action they were being asked to support.

This led to a searching analysis of the subject of uniformity of traffic law and the enforcement of traffic law.

### The Importance of Uniformity

The obvious argument in favor of uniformity regarding traffic regulations is that the gigantic free-wheel transportation system of America would cease to function, if, for example, some states or cities required vehicles to drive on the left-hand side and other jurisdictions required them to drive on the right-hand side.

This simple reasoning resulted in early efforts to obtain uniform traffic law in states and cities. Substantial progress has been made. The traffic and safety experts have agreed upon the "Uniform Code," parts of which have been adopted by most states and cities. More recently the Automotive Safety Foundation, through its Uniform Laws Division, has been doing splendid cooperative work with states and cities which is resulting in their making "comparison studies" of their statutes and ordinances. The inventories resulting from such studies show precisely what changes are needed to bring them into conformity with the uniform code and with national standards.



Thus within the foreseeable future each jurisdiction will have inventoried its laws and taken steps which will give us *uniformity of the written law in states and cities.*

This is an exceedingly important step which must be taken because the written law is the foundation upon which all the rest of the traffic control structure must be built.

But even with a good foundation it is *possible* to build a disorderly house which makes the foundation of little value in such instances as far as the word *uniformity is concerned.*

Thus it is necessary to think through the problem of uniformity far beyond the foundations. The following parts of the problem are apparent to everyone.

The uniformity of the written law, while an imperative first step, is of little practical value if:

(a) Every police chief interprets the law differently and instructs his men differently.

(b) Every police officer interprets it differently.

(c) Different charges are made for identical illegal driving acts.

(d) Every violations bureau posts different fines to be paid on a plea of guilty for identical offenses.

(e) Every judge interprets the law differently and places a different evaluation upon an identical offense under identical circumstances.

(f) Every safety organization engaged in providing public education interprets the law differently and disseminates different, diverse, conflicting programs.

(g) If every motorist, noticing the different interpretations, makes his own still different interpretation.

Thus to make uniformity a reality it is necessary to have:

Uniformity of the written law
Uniformity of administrative interpretation
Uniformity of charges
Uniformity of instructions to officers
Uniformity of court treatment (adjusted to fit the individual violator's personal situation)

Uniformity of public education.

Thus it takes uniformity in six ways to bring about uniformity at the end of the line where it really counts and that is, in terms of the motorist actually being presented with practical day by day uniformity.

*Importance of Uniformity to the Safety Movement*—By and large our laws regarding driving on the right-hand side of roadways, *making turns, signalling, stopping* at stop signs and traffic signals, etc., are fairly uniform. It would be hard to prove how many accidents can be traced to a lack of uniform wording of law today, without going through all of the stages previously discussed.

Perhaps the most serious aspect of a lack of uniformity is its effect upon the accident prevention program.

It is generally conceded that the great hope of reducing traffic accidents lies in ultimately obtaining voluntary compliance with traffic laws on the part of motorists. It *is also* generally agreed that *the most* effective way of encouraging voluntary compliance is an accident prevention program which is a combination of traffic law enforcement preceded by and supported by a vigorous public educational program.

How can we hope to obtain voluntary compliance to a maximum degree if the individuals on the safety team present to the public a non-uniform and non-consistent program in so far as the traffic regulations and their violation are concerned. If the police can't agree, if the judges can't agree and if the educators can't agree on interpretation and actions against violators, how can it be expected that we can get the public to agree—and to comply voluntarily?

You may hear Mr. and Mrs. Motorist say:

"Officer Johns would not have stopped me for this left turn"

"Why doesn't our police do what the police of "X" town are doing"

"Why did I have to pay twice as high a fine in a neighboring city as I would at home?"

So long as the public can make these statements, it is not likely that the public will be impressed with uniformity or believe

that police departments are well organized outfits that are operating under a carefully thought out uniform accident *prevention* program.

In other words, a lack of practical simple uniformity injures the reputation and good will of the enforcement and safety officials and reduces their chances of getting more public support in the future and of thus ultimately getting much greater voluntary compliance with traffic law on the part of motorists.

Conversely, if the police, the court and the educators can develop and agree on a plan which will produce practical uniformity from the point of view of the motorist, then their public relations and public support position will be considerably improved.

If the chief of police can say to an important citizen, "We are operating under the same uniform system as the rest of the cities," the citizen is likely to feel less critical about his friends being "pinched" than if the chief could not say that and thus the citizen would be likely to think that his friends were partially the victim of some "crack-down" plan which was strictly a local product.

If a judge can say to an important citizen, "The amounts of the fines used in our traffic violations bureau are identical with those of neighboring cities," then the citizen is more likely to think they are reasonable and fair compared to reading in the paper about a local squabble as to whether the fines were too high or too low and the complete absence of consistency or uniformity with other communities.

Thus it is believed that uniformity is a word of some importance in terms of future public support for traffic law enforcement program improvements which are certain to reduce accidents if supported.

This line of reasoning on the part of law enforcement and safety administrators in Michigan during many months finally led to a movement to do something about it.

*June 13, 1945*—A large group of officials met with Mr. Daniel G. Reynolds, Director of Field Service of the International Association of Chiefs of Police, and began the development work.

*July 1946*—A 31-page printed training manual was prepared.

*July 8-18, 1946*—Five training schools were held for all officers of five "pilot" cities.

*August 1946*—The five "pilot" cities began using the new system.

*April 2, 1947*—The Michigan Association of Chiefs of Police formally "approved, endorsed and recommended" the system, based on six months favorable experience.

*June 7, 1947*—The Michigan Association of Municipal Judges endorsed and recommended the system.

*July 8, 1947*—A meeting of the chiefs of police and heads of traffic divisions of ten of the remaining larger cities in Michigan resulted in these cities plus their neighboring cities agreeing to adopt the system.

*January 5-23, 1948*—Ten training schools were conducted for 29 additional police departments.

*February 1948*—Twenty-nine cities launched the new system.

*February 1948*—Twelve Michigan cities began using the Michigan Uniform Traffic Fine Schedule for Violations Bureaus.

*April 28, 1948*—A special committee prepared a "Court Support" program utilizing the leaflet "We Don't Want Your Money."

*June 1, 1948*—Twenty-three cities began using 119,000 copies of the court leaflet.

*May 10, 1948*—A committee began development of a "Training Manual on the Apprehension of Speeders."

*June 7, 1948*—Seventy-one police departments conducted training schools using the manual on the apprehension of speeders.

*July 19, 1948*—Development work began on an "Open Highway Speed Policy."

There still remain additional detailed expanded manuals on each of the items included in the Michigan Plan but the overall framework of a workable system has been completed.

In summary then, the law enforcement and safety officials of Michigan, with the assistance of the Traffic Division of the International Association of Chiefs of Police and the Traffic Court Conference of the American Bar Association have developed a new *system* of traffic law enforcement.

### What Is the System?

The system has been called the "Michigan Uniform Enforcement Policy" because one of its more important advantages is that it makes it possible for police departments, courts and safety educational organizations to operate in such a manner that the public will feel that it is being treated consistently and uniformly throughout the state.



To develop a "system" which would make it possible to have "practical uniformity" it was naturally necessary to first make a great many other fundamental improvements. Only when these were completed and assembled into a single package was it possible to proceed with its application to a group of cities which naturally began to have uniformity and consistency, as between each other, because they would all be operating under the same identical plan which had been previously agreed upon.

The system is composed of the following specific items:

(1) A greatly improved traffic ticket.
(2) A "hazard rating scale" for administrative use.
(3) A written warning system with teeth in it.
(4) A uniform fine schedule for traffic violations bureaus.
(5) Printed training manuals.
(6) A public education—public support program for enforcement.
(7) A public official conference program.
(8) Twenty zone or area training schools.

*The Improved Traffic Ticket*—The new traffic ticket is called the "Michigan Uniform Traffic Violation Notice." This identical ticket is used by the 34 police departments which have already installed the system. The only difference is the name of the city and the statement at the bottom as to where appearance should be made. This ticket has thus become the *symbol* of uniformity to the police, the court and the public. The following are the more important advantages of the ticket:

(1) It has printed upon it the "Six principal violations causing most accidents." Thus in eight out of ten stops which an officer makes for a moving violation, he merely checks the proper boxes and does not have to "write in" the charge in longhand.

(2) The 18 illegal driving acts which constitute a violation of the six traffic laws are printed on the ticket. These are stated in specific terms most likely to be interpreted the same by a police officer, a judge or a motorist.

(3) The six "conditions that increased seriousness of violation" are printed on the ticket. There are 17 boxes after each specific term to be checked when they apply.

The 35 boxes for checking after each of the specific terms are of great significance. They represent the agreement between hundreds of traffic and safety administrators and made it possible to prepare training manuals capable of giving police officers positive direction rather than generalities incapable of producing either uniformity or consistency.

The moving violations *not* printed on the ticket are "written in" by the officer in a space marked "other violation." But this handwriting is only required in two cases out of ten.

Most cities have parking meters and a separate book is customarily used by a "parking detail."

In more serious charges such as "driving under the influence," "reckless driving," "car out of control," "careless driving," etc., the 35 printed boxes are of extreme value in showing why the more serious charge was made. With these boxes available it becomes much easier to do a good training job on when such charges may properly be used and when they *should not* be used.

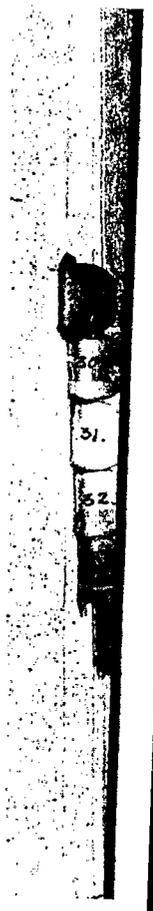
Such charges are "written in" in a space marked "other violations."

It is immediately apparent that the ticket establishes a single set of ground rules under which the game of accident prevention can be played with less confusion and irritation by the public, the police and the courts.

### What Is the "Hazard Rating Scale"?

During the analysis of hundreds of confusing terms, charges, policies, etc., it was soon discovered that it would never be possible to reach agreement on the part of officials unless some framework could be created into which could be fitted all of these elements.

It seemed logical to lay down some form of scale at the bottom of which would be the least important items and at the top of which would be the most important items. By arranging all of the items on this scale, it might then be possible to get agreement



between police administrators as to what action should be taken on each item and to get agreement between judges as to what would be a fair penalty for each item—or combination of items.

Next it was discovered that the phraseology or wording of the traffic laws was so general that within any one law there were several specific illegal driving acts. It was thus necessary to use these specific driving acts for placement on the scale rather than the broad legal wording. Thus, for example, the general charge "illegal left turn" did not describe what the driver did. Did he fail to signal? Did he cut the corner, or did he turn left from the right-hand lane?

By "cut and try" it was discovered that the most practical arrangement was to divide the scale into three units. The left third were the least serious maneuvers, the right third were the most serious maneuvers, and the middle third were the middle serious or "more serious" maneuvers.

In similar fashion the six conditions were arranged on the scale.

With all of the maneuvers and conditions placed on the scale, these were then converted to three columns. The first column was given a unit rating of one unit, the second column—two units and the third column three units.

Once the scale was completed, attention could then be given to the use of the scale by the police and by the courts.

From the administrative and operations point of view, the following decisions have *always* had to be made:

(1) Was the illegal driving act under the conditions serious enough to require:
   (a) No stop at all, or
   (b) A stop resulting in a warning, or
   (c) A stop requiring appearance in court and a fine.

(2) How much of a fine would be fair and in keeping with the threat against public safety produced by the illegal driving act in combination with the conditions prevailing at the time?

(3) Was the combination of the illegal driving act in combination with the prevailing conditions relatively serious enough to require:
   (a) A trip to the violations bureau, or
   (b) A personal appearance before the judge.

(4) Was the combination of the illegal driving act or acts in combination with the prevailing condition or conditions relatively serious enough to use the more serious charge of "reckless driving"?

These seven different decisions have to be made every day by thousands of officers directed by hundreds of chiefs of police and heads of traffic divisions and by hundreds of judges, clerks of the court, city attorneys and prosecutors.

With everyone "on his own," with 6 violations, 18 illegal maneuvers, 6 conditions and 35 items, it was quite obviously beyond the capacity of the human brain to have everyone come to a uniform conclusion—unless a simple scale with unit values could be developed and agreed upon.

After hours of healthy debate and generous adjustment of individual preferences for the good of a sound plan, the public agreed as to where the administrative lines should be drawn. These were as follows:

One unit requires no stop by the officer.

Two units requires a written warning (first offense only).

Three units requires a trip to court and a fine.

Six units or more requires consideration to using the "reckless driving" charge.

The warning level of two units was later raised to three units (with the third column an exception) because the two-unit level failed to produce a fair proportion of warning type cases.

Thus by administrative agreement, the pooling of the best thinking of the police administrators, four administrative lines were drawn under which it was possible to train officers and give them positive direction sufficiently specific that motorists in different communities might receive uniform, consistent treatment by the police.

In similar fashion the judges agreed on their administrative levels. This will be discussed later in this presentation.

Attention is directed to the fact that the great significance of this development is *not* the detailed points and *not* the actual levels selected. The tremendous gain is the pooling of administrative judgment and the cooperative agreement among the leaders. The cooperative uniform plan was made *by them* and can be and will undoubtedly be changed *by them* as future conditions change. But the changing of the small pieces does not detract from the all important structure and framework of the uniform plan and policy.



*What is the Written Warning System with Teeth in It?*—While legitimate stops of violators which result in court fines are the backbone of enforcement, it is generally agreed that the total number of official police contacts with motorists represents the total educational pressure exerted by enforcement efforts to encourage voluntary compliance with traffic laws on the part of motorists.

The most common non-fine producing type of officer action is the stop which results in a warning.

Since verbal warnings too often result in the violator congratulating himself on having talked the officer out of a ticket the new system was utilized to provide a written warning requiring a trip to court to have the record checked and the filing of the regular Michigan Uniform Violation Notice against the name of the violator where its presence will prevent any future warning and produce a fine.

Such "instructional warning" tickets serve several valuable purposes. In the absence of such a system most of the marginal violators continue on their way without benefit of any restraining action for the legitimate human reason that an officer is reluctant to write up what he thinks of as a very minor violation because he knows in advance what the amount of the fine will probably be and believes this to be too much. If he does stop a marginal violator he does not have too much faith in the restraining effect of his verbal admonition.

The Michigan system requires the same trip to the violations bureau as if no warning were involved. It results in a warning only after the record has been checked and the violation is found to be a first offense in 12 months.

The potential future contacts of this system are almost unlimited. Ultimately, as increased pressures which cause accidents produce a need for additional enforcement action, this warning system will permit doubling the number of police contacts if necessary without resulting in the negative public reaction which would be produced by doubling the number of traffic fines.

*What Is the Michigan Uniform Traffic Fine Schedule for Violation Bureaus?*—It is generally agreed that the part played by the court in the total field of traffic law enforcement is just as important as the part played by police departments.

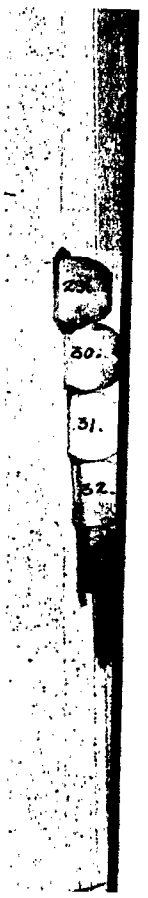
If the action taken by the court fails to deter the violator from continuing to violate the law then in a large measure the action of the police officer in apprehending the violator has been wasted.

There is little question but that when a violator stands before the judge, receives a fair and impartial hearing, and if found guilty is fined an equitable amount accompanied by an explanation of how accidents are caused by violations, that the violator is impressed considerably and hence his future attitude toward driving is influenced in the direction of safety.

Unfortunately this effective judicial process, still recommended by everyone, was not continued as the regular procedure for all traffic cases as automotive transportation sky-rocketed in America. The sheer volume of traffic cases swamped the courts and made it difficult to spend the vitally needed time to deal with even more serious cases such as those involving murder. Since it apparently was not possible to greatly increase the number of judges to hear the greatly increased number of traffic cases, the traffic violations bureau or so-called cafeteria court was invented and adopted by most large communities.

This violations bureau provided a predetermined fine for each offense which could be paid upon a plea of guilty or upon forfeiture of a bail bond. Such fine schedules were generally mimeographed or printed.

Thus in practice today in most jurisdictions the majority of moving violations are handled in violations bureaus without benefit of the impressiveness of a personal appearance before the judge and without benefit of the skilled reasoning of the judge in determining from the facts in the case how much of a fine would be equitable.



The result was that violations bureau fines were flat fixed amounts which for a particular violation did not take into consideration the degree of seriousness of the violation nor the degree of seriousness of the conditions present at the time and place of the violation. And the amounts of these fines were in most cases quite different in most communities.

The present court situation is thus about as follows:

(1) Only a small proportion of moving violation cases are heard personally by a judge.

(2) Strenuous efforts must be made to obtain more judges to hear personally a higher proportion of moving violation cases.

(3) It does not appear practicable within the foreseeable future to obtain enough judges to hear personally all moving violation cases.

(4) Thus at the moment, and to a large degree for the next 10 years, the fact remains that most moving violation cases will be handled by violation bureaus.

(5) It therefore follows that violations bureaus represent the part of the court operation where improvements will affect the majority of cases.

(6) Since the posted fine schedules are neither uniform, consistent nor equitable, it appears logical to undertake development work to improve the characteristics of uniformity, consistency and equitableness.

(7) Unquestionably such improvements in traffic violation bureaus will make the bureau process look more intelligent and reasonable to the violator and hence it is likely that the payment of a fine can be expected to have a greater effect on the violator's future behavior.

This line of reasoning was an important influence which led to the establishment of the "system" called the uniform enforcement policy.

Once the court problem had been thought through it became obvious that it was impractical if not completely impossible to improve the uniformity; consistency and equitableness of fines until a system had been worked out which would improve the uniformity of action by police officers, provide more accurate and comparable information, and create an administrative hazard rating scale to serve as a basis for court action.

The new traffic ticket called the Michigan Uniform Traffic Violation Notice has printed upon it the essential information arranged in a form which made the hazard rating scale obvious.

Therefore, all that was required to create the Michigan Uniform Traffic Schedule for violation bureaus was to put dollar signs over the columns. The violator pays a total fine composed of so many dollars for the degree of violation committed *plus* so many *additional* dollars for each of the conditions present which increased the seriousness of the violation. Thus the total fine comes far closer to representing equitably an amount in keeping with the threat against public safety.

The actual amount of fines represented by the dollar values over each column was determined by "cut and try" to average out about the same as the average fine previously assessed by the cities prior to the adoption of the system.

By the simple process of adopting the system, the cities automatically obtained uniformity, greater consistency, and greater equity or fairness to violators

The hazard rating scale may also be scored for the total number of units so that those above a pre-determined level may be prevented from paying at the violation bureau and be required to have their case heard personally by the judge.

*How Does the System Help the Individual Police Officer?:* Individual police officers like the system for the following reasons:

(1) The ticket physically and mechanically is easier to fill out because of checking rather than writing. (He also likes the snap out carbons making it unnecessary to stuff used carbons back in the book.)

(2) The specific terms printed on the ticket remove any question in his mind about what is meant in ordinary verbal interpretation of the law.

(3) The fact that the uniform ticket and the uniform system are being used by dozens of departments and hundreds of men, draws violators complaints away from him personally.

(4) Because the ticket contains most of the essential items, it serves as a reminder and he is less apt to omit items and thus less apt to be criticised for such omissions.

(5) Because the ticket contains most of the essential information, the judge is less likely to call the officer into court to explain in person just what he saw the violator do that was dangerous and illegal.

(6) When the officer is called into court to testify, the check marks on the ticket serve to fresh his memory as to what happened much better than could a few notes written in longhand.

(7) The officer feels much surer of his ground in understanding that the policy of his department and the court is when this policy is is printed form rather than being passed down to him verbally through several different persons each of whom uses his words a little differently.

(8) The printed ticket and training manual make it possible for him to get much more out of the training schools he attends.

(9) The system, because it lends itself to an especially effective public educational program, gives the officer more confidence in approaching the violator because he knows that the violator has been told in non-confusing language just what he should do and just what will happen to him if he fails to do it.

(10) The officer is happier about his relationship with the court because he knows that his department and the court are now operating under the same ground rules which have been jointly agreed upon.

(11) The officer feels happier about stopping motorists for lesser degrees of violation because he knows that it will result in a written warning rather than a fine if it is a first offense.

(12) The officer feels better about making stops because he feels that the new fine schedule is fairer because it is higher when the threat against public safety is higher and lower when it is lower.

*How Does the System Help the Chief of Police?* Chiefs of police have indicated that they like the system for the following reasons:

(1) It gives them the support of a great many other chiefs, judges, city attorneys, prosecutors, mayors, city managers, newspaper editors, safety administrators and all those who are backing the system. This takes the "heat" off of the chief's office and removes the personal element as a target of criticism by violators.

(2) It improves his day-by-day working relationship with the court because the court has agreed to support a system, which because it is in print reduces opportunities for misunderstanding.

(3) It gives him the support of the city government and removes the opportunity for a citizen or a violator to state that the mayor is against a plan developed by the chief of police.

(4) It makes it much easier for him to explain to his men his enforcement policy.

(5) It makes it easier for him to conduct a training school.

(6) It makes it easier for him to explain to an important citizen just how his department operates because there is a "system" printed in black and white.

(7) The improved public education made possible by the system improves the public relations system of his department and enhances his own personal and professional situation.

(8) It improves his position with the local newspaper because the editor was a party to the original meeting at which it was adopted and because the printed system makes it easier for him to explain to the press how his department operates.

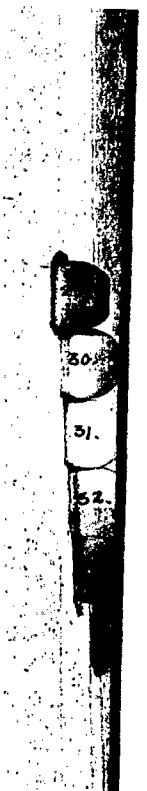
(9) The chief of police of a smaller community cannot be accused of "running a speed trap" when he is able to state that his department is using exactly the same system as other larger communities and produce a printed document in proof of his statement.

(10) The system provides him with additional information regarding the performance of each of his officers thus making it easier for him to do a better job of supervision.

(11) The written warning part of the system places the chief in the position of being very fair to the motorist who is a first offender and as such has public sympathy.

(12) The printed system provides a specific framework to which the chief can easily attach stray items and loose ends which otherwise are hard to keep track of.





*How Does the System Help the Court?* The judges and other court officials have indicated that they like the system for the following reasons:

(1) It improves their relationship with the police department because there is a system in writing to serve as a basis for good cooperation as to policy and procedures.

(2) The new ticket provides them with the full information which helps them to visualize what the officer saw and thus be better able to determine an equitable fine if the individual is guilty of the offense.

(3) The specific terms make it less necessary to call an officer in to determine what was the exact driving act or maneuver which constituted a violation.

(4) The ticket, in two colors, does a safety educational job which makes the action of the judge in assessing a fine look more fair to the violator.

(5) The written warning system places the judge in a more favorable position when dealing with a second offense case because he can inform the violator that he was given a fair warning and since he failed to respond to this fair treatment the court is left with no other alternative but to take a more stringent action which appears to be necessary to cure the violator of his habit of driving illegally and dangerously.

(6) The system because of its specificness results in the officers more properly using charges and less often using charges improperly, especially in regard to the charge of "reckless driving."

(7) The support of the "official family" of the community places the judge in a more favorable light with the public, and this has special values due to the fact that the actions of the court "cost violators cash" and that most violators and motorists are constituents who will vote at the next election.

(8) The "self-leveling" and "self-adjusting" characteristics of the Uniform Fine Schedule represent a partial extension of the judges analytical discretion to violation bureau cases, thus adding considerably to the fairness of the fines. Since the violators believe the judge sets these fines, this increase in fairness reduces their complaints against him.

(9) The use of the same uniform fines in violation bureaus by many cities helps to prevent any one judge of being accused of being a "tough judge" or a "soft judge."

(10) The system as agreed upon by the official family makes it easier for the judge to explain to the press how the court works.

(11) The exchange of tickets of non-residents between communities gives the judge more past information regarding the driving history of a resident violator.

(12) The printed system utilized in a thorough training school makes it possible for the judge to turn aside violators charges that the officer did not know what he was doing and point out that what the officer was doing was in accordance with a specific plan which the court helped work out.

*How Does the System Help the Violator?* Violators have indicated that they like the system for the following reasons:

(1) Since the same identical system is being used by many cities they have more confidence that they are being treated by the police department in a fair and consistent manner.

(2) Because the printed system was used in a comprehensive training school they have more confidence that the officer who apprehended them was doing the same thing as any other officer would have done.

(3) The printed items on the ticket tell them in specific language exactly what they are being accused of doing rather than some generalities which might be interpreted a number of different ways.

(4) The items printed on the ticket tell them something about the policy of the police department which policy had previously been confusing to them.

(5) The written warning on a first offense for a minor violation appeals to them as being much fairer than a fine.

(6) The fact that the violation bureau fines are the same as in other cities make them realize that their city is not being especially severe with them.

(7) The fact that the violation bureau fines are less for less severe cases and more for more severe cases appears to be fair and explains to them why it is reasonable that some fines should be higher or lower than others.



(8) The fact that the plan has the support of *all* city officials gives the violator more confidence in it than if it were just the plan for one man.

(9) The fact that the public educational program has been geared to the plan gives them the feeling that they were told exactly what was going to happen to them and thus should hardly feel surprised.

(10) The fact that fines are higher for those violators who drive illegally at night, on wet pavement, in heavy traffic, and cause people to dodge, almost hit someone, or actually bang a fender, supports their own contentions and makes them less unhappy about their own case.

(11) The total system and its state-wide aspects tends to give the violator the feeling that he is dealing with a well-run outfit which knows what it is doing rather than merely being victimized by an individual officer or court official.

(12) The two-color printed ticket gives them considerable safety information which will help to keep them from being apprehended or involved in an accident in the future.

*How Does the System Help Other Motorists?* Motorists who have not been apprehended by the police for a traffic violation have indicated that they like the system for the following reasons:

(1) It makes sense because it is a system whereas previously they did not have the feeling that either the police or the court had a well-thought-out plan of operation.

(2) Because if they violated the law they would hope to be treated the same by each officer.

(3) Because if they violated the law they would like to be treated the same in each city.

(4) Because the city officials are in agreement rather than in conflict on how to reduce accidents.

(5) Because the traffic fines are explained and look reasonable.

(6) Because the written warning system appeals to their sense of "fair play."

(7) Because they like to be told about how the court and the police departments operate.

(8) Because they believe police officers should have more training.

(9) Because they know something about how the system works they can answer questions asked by some friend who has been "picked up" by the police.

*What Are Some Over-All Values of the System?* The hundreds of administrative leaders who have helped to develop the system point out the following over-all values of the system:

(1) By pulling together the officials of each community and those of many communities on a cooperative project it lays the foundation for working together more closely in the future with obvious advantageous results.

(2) It gives such state associations as the chiefs association or judges association specific worth-while service projects which assist in building up the organization.

(3) It pools the best administrative thinking of administrators and produces a better system than any one administrator could develop alone.

### What About the Judgment of Individual Officers?

Police administrators are generally agreed that an important element in building a good traffic law enforcement program is the process of building up the judgment of individual police officers. Thus it is important to study the Michigan system to see how it affects this situation.

At the outset it must be remembered that the "judgment of the individual officer" is already restricted by the traffic law itself. The elements of the Uniform Enforcement Policy System are merely an extension of these same laws. The development of a clearly defined policy expressed in specific terms merely gives positive direction to the officer and encourages him to apply his personal judgment in a direction most likely to reduce accidents. Individual officers have indicated that they prefer such positive direction in the form of a printed policy because it removes any doubt as to exactly what their superiors wish them to do.

It seems logical that good individual judgment of an officer should produce better results if applied within the framework of a plan or system compared to being applied without a plan or system.



### What About Violations Not Printed on the Ticket?

The six violations printed on the ticket were selected on a volume basis. By volume they were found to be involved in more accidents than any of the other moving violations. Thus by volume more stops should be made for these than for any other violations. Thus they cover some 80 per cent of the day-in and day-out stops by officers.

A total of six violations were decided upon because it would be impractical to print 50 violations on the ticket, merely to cover them all when 44 of these would be used only infrequently and in proportion contributed to accidents far less frequently. Within the limits of space there is no reason why 10 violations could not be used rather than six.

The selection of these six violations naturally will tend to encourage officers to make most of their stops for them. But this should be helpful if they are involved in most of the accidents.

It is *not* believed that merely because a "one-way street" violation is not printed on the ticket that this will prevent an officer from stopping a motorist he notices going up a one-way street in the wrong direction.

Nor is it believed that the printing of the big six will prevent officers from stopping motorists for illegal "U" turns, double parking, etc.

Highly specialized problems at particular intersections or on particular streets require special training and special instruction. This is an important application of selective enforcement. Training and instruction are certainly of greater influence than the form of a ticket.

For open highway use there are some nine additional items which should be added to the ticket.

The test, in the long run, of whether the ticket has printed upon it the correct violations or enough of them, will be whether or not they account for 80 per cent of the stops which should be made by officers for those violations which by volume are involved in 80 per cent of the accidents. The remaining 20 per cent of the violations will be spread over perhaps 20 to 50 individual "other violations."

Changes are certain to be made. But it is hoped that they can be made collectively so that just as much uniformity as possible can be retained.

### Conclusion

The author wishes to again emphasize the fact that this presentation is made on behalf of the Michigan groups. *No* one man nor small group of men developed this system. It is the product of the efforts of hundreds of officials.

The Michigan group has developed a "system." This system is the first of its kind. It may not be perfect but it is a lot better than no system at all.

It is hoped that police court and safety officials throughout the country will view this pioneering attempt with sympathy and be kind enough to continue to assist in its future development. To reach its proper level of refinement it will need the help of everyone if it is to be of maximum assistance in reducing accidents.

There can be no question about the need for the development of "a system" which would make uniform traffic law enforcement a practical reality. If it had not been developed in Michigan it would have fought its way to the surface in some other state.

It is hoped that the pioneering efforts of the Michigan group may serve to stimulate all administrators in the direction of developing and perfecting "systems" of traffic law enforcement which will prove more value in the future.

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# What Can We Do with Traffic-Accident Repeaters?

By DR. HERBERT J. STACK
Director, Center for Safety Education, New York University

It has been known for many years that a relatively small percentage of automobile drivers, ranging from 5 to 10 per cent, have far more than their share of accidents, and are charged with far more than their share of violations. These are known as "repeaters," accident-prone, or chronic violators. *Studies* have shown that over a 6-year period, 4 per cent of the drivers had 36 per cent of the accidents.

These motorists have become one of our serious problems, for even though they are in the minority, they are the "sick" drivers—the ones who need correction most or, if necessary, removal from the highways. They are the trouble makers who appear too frequently in our courts as chronic violators. Since the percentage of these drivers is small and the harm that they do is relatively great, this group deserves the special attention of license authorities.

There are analogous cases in other fields. The schools, for example, are focusing a good deal of attention on children with visual or other disabilities—the mentally retarded and the delinquents. Health clinics are directing attention to patients suspected of diseases such as tuberculosis, rheumatic fever, and heart ailments. All through our society today, efforts are being made to locate persons with disabilities and provide treatment or correction. It is the same in the field of driving.

While there are convincing arguments for periodic reexamination of *all* drivers, progress in this direction is slow. There are various reasons for this, an important one being the tremendous number of drivers involved. On the other hand, the examination of the 5 to 10 per cent—the problem drivers—would not be too difficult. In fact, this is being handled to some degree in Connecticut and in other states through drivers' clinics.

It was the firm confidence in the practicability of such clinics that prompted the New York University Center for Safety Education to carry on the investigation in Connecticut and Michigan during the past year. The Center has been provided with funds earmarked for such research by the Eno Foundation for Highway Traffic Control. One study was conducted by a group of ten experts in the fields of enforcement, engineering, and education, and will be published this fall as a 200-page manual entitled *The Driver—His Nature, Needs, and Improvement.*[1]

The second study was concerned with the physical and mental characteristics of accident-repeaters. This is now being published as a monograph by the Foundation.[2] I will summarize the most important conclusions, observations, and recommendations.

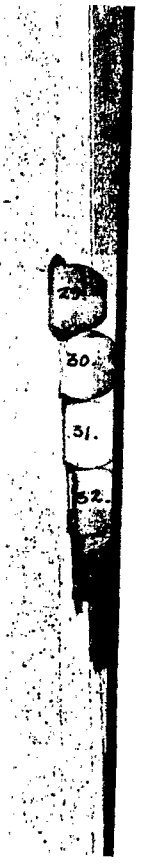
Before starting this investigation, which was carried on in cooperation with the Connecticut Motor Vehicle Department and the Michigan State Police, the Center staff first reviewed all the related studies of the past quarter of a century. Research such as that of Lauer of Iowa State[3] and DeSilva at Harvard and Yale[4] covered several years and made significant contributions to our knowledge of drivers. These and the other researches were carefully analyzed and evaluated before planning the investigation. The staff considered also Johnson's interesting criticism of past research studies, "The Detection and Treatment of Accident-Prone Drivers," published in the *Psychological Bulletin* in 1946.[5]

In the Eno investigation in Connecticut and Michigan, 513 drivers were tested. Of this number 127 had to be dropped because they could not be matched. In the final matching there were 386 drivers evenly divided into "repeaters" and accident-free. The repeaters were selected on the basis of bad driving; the "free" on the basis of a perfect record over a 10-year period. The accidents were considered on the basis of mileage exposure. The accident rate for the repeaters varied from as low as 2 per 100,000 miles up to more than 50.

An important point should be stressed right here: Sometimes we accuse operators of commercial vehicles of being serious repeaters, when as a matter of *fact* they are no worse than the average driver; it is just that their mileage is much higher. Another point: Only a few women were summoned to the clinics. The newspapers immediately concluded that the women were superior drivers. But the average woman driver covers only 2,500 miles a year. That is not one-third the mileage of the average man, nor one twentieth that of the average commercial vehicle operator. Therefore, any comparison of drivers which is not on a mileage basis is unreliable.

The two groups were matched in pairs on the following basis: sex, age, yearly mileage, occupation, and type of vehicle driven. In some cases, as in the Connecticut clinic, this matching was not perfect, especially with regard to age. The average





annual mileage for the two states was approximately the same, between twenty-six and twenty-seven thousand miles. The striking difference between the groups was that the repeaters had 853 accidents and 1100 violations, while the "free" had no accidents or violations charged against their 10-year record. The accident-free drivers had amassed a total of more than 40-million accident-free miles, which is equivalent to driving 1600 times around the earth at the equator, or making 8,000 round trips across the United States. The repeaters, on the other hand, had traveled approximately the same mileage, but had had 853 accidents and 1100 violations.

Why this striking difference between two groups of motorists, both of which were holders of drivers' licenses, had the same rights under the Constitution and were employed in much the same type of work?

It is impossible to discuss in detail the types of tests used in the clinic. A complete description of the testing procedure will be included in the forthcoming monograph. Suffice it to say that drivers were given a complete testing for a period of an hour and a half with the most reliable instruments that could be found. The interview alone, which consisted of 100 questions, took thirty minutes. A complete battery of vision-testing instruments was included, together with instruments measuring emotional stability, personality adjustment and driver attitudes. The clinical staff in each state consisted of ten to twelve persons trained in the administration of tests and interviews.

### Results of the Study

The following are the most significant findings of the study:

1. Repeaters tend to be less well informed than the accident-free with regard to safe driving practices and regulations. The more serious repeaters, those with an accident rate of 25 or above, have the lowest scores on traffic tests.*

2. Repeaters tend to have more personality maladjustments than the "free." Here again, maladjustments tend to increase among the more serious repeaters. The Cornell Word Form was used for this test.†

3. Repeaters tend to have poorer motor control under normal conditions, as well as under conditions of frustration and annoyance. Serious repeaters tend to be more upset by annoyances and frustrations than any other group. The tendency on the part of some drivers to "lose their heads," "go to pieces," or "get emotionally upset" is apparently strongest among the repeaters. They are not as well balanced emotionally and tend to be confused more by annoyances and frustrations.

4. Attitudes toward certain aspects of driving are significantly poorer among repeaters. To determine this, attitude tests were used and the significance of differences was determined by using the chi square technique.

5. Repeaters tend to show a preference for higher speeds, both in daylight and in darkness. This was notably true in the Connecticut group.

6. Repeaters indicate a higher estimation of their ability to consume intoxicating beverages without having their driving affected.‡ This was most marked in Connecticut. Some drivers felt that they could consume from ten to eighteen cocktails without being affected, yet even five cocktails might be sufficient to put such drivers in a condition known as "under the influence."

7. Repeaters also have been arrested more than the free on charges of misdemeanors other than traffic. This may or may not be an indication that in general they are less respectful toward the law.

8. Repeaters also have many violations charged against them. In fact there is a high positive correlation between accidents and violations. In one sense repeated violations may be considered a symptom of a future accident. Drivers who consistently violate regulations are out "looking for an accident."

9. There was no significant difference between the visual acuity of accident-repeaters and "free." Variations of acuity between 20-20 and 20-50 vision do not seem to be important. Yet there were more repeaters with serious acuity disabilities.

10. In Michigan, significant differences were found in the monocular and binocular acuity, stereoscopic depth perception, and ocular muscle balance. Both clinics revealed serious cases of visual deficiencies among the two driver groups.



11. In tests of visual fields or rate of dark adaptation, there seemed to be no great difference between the two groups. About as many persons with poor adaptation, commonly known as glare recovery, were found among the "free" as among the "repeaters." The complete battery of visual testing equipment of the American Optical Company was used in the investigation.

There were certain aspects of the testing that revealed no significant differences between the two groups:

1. Systolic and diastolic blood pressure
2. Recreational interests
3. Education
4. Weekly income
5. Health adjustment and practices
6. House adjustment.

Similarly, repeaters had completed about the same number of years' schooling as the free, approximately ten.

### What Can We Do with Accident-Repeaters?

Among the driving population a small percentage are chronic violators and repeaters. These drivers cause far more than their share of accidents. A conservative estimate of the cost of accidents of the Connecticut and Michigan repeaters was well over $500,000. On the other hand, the accident-free group had cost the insurance companies little or nothing. In view of the facts revealed by this and other investigations, the following recommendations are made:

1. That the states establish clinics to investigate accident-repeaters and attempt to remedy disabilities. In small states this work could be done by one large clinic; in larger, by several clinics located in centers of population.

2. That every state set up an accurate system of accident reporting. This is a basic responsibility and altogether too few states now have anywhere near an adequate system. Serious repeaters would be the first summoned to the clinics. A point system related to accidents and/or violations might be established, as in Connecticut, and drivers called in when they had four or five points against them.

3. That these clinics be operated by examiners of the Drivers' License Bureau, examiners with experience and training in psychology to be assigned to the work.

4. That in addition, clinics be used to secure supplementary data regarding drivers called on for hearings where suspensions or revocation of licenses is being considered.

A complete clinic should have the types of equipment listed in the accompanying table.

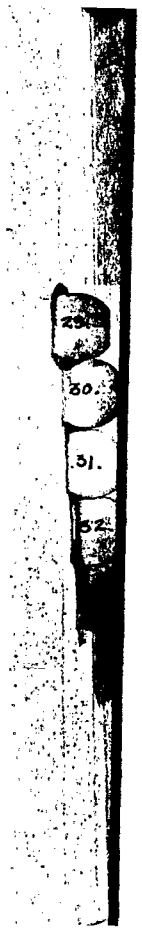
**For the Large Clinic**

| *Equipment* | *Testing* | *Minutes* |
|---|---|---|
| 1. Personal Record Sheet | | |
| 2. Sight Screener (or equivalent) | Acuity, depth perception, muscle imbalance, binocular vision | 7 |
| 3. Perimeter | Field of vision | 3 |
| 4. Adaptometer | Light adaptation | 8 |
| 5. Knowledge Test* | Traffic information | 15 |
| 6. Cornell Word Form* | Personality adjustment | 10 |
| 7. Motor Performances | Stability | 5 |
| 8. Attitude Test* | Attitudes | 10 |
| 9. Reactometer | Selective reaction | 5 |

*Can be administered to several drivers at a time.

It is suggested that part of the equipment listed above be used, such as items 1, 2, 3, 5, 6, 7 and 8.

While we have discussed this subject largely from the standpoint of the state, obviously the clinical approach is applicable equally to the commercial fleet. When drivers have repeated accidents, they should be called in for conferences. In connection with these conferences, the supervisor may wish to have certain tests given that will reveal any disabilities. This is commonly known as "spot" or "selective" testing. For example, a driver who has had several night accidents would be given the glare test. One who showed emotional instability would be given a stability test, such as the Cornell Word Form. The object is to find out what is wrong with the drivers and to attempt correction, or, if



the situation is more serious, to recommend transfer to another job.

### Corrective Measures

Having discovered certain driver weaknesses or disabilities, what can be done? This subject alone might very well take all the time that is at my disposal. Our tests showed a surprising lack of information regarding ordinary safe practices. It appears that the states have not discharged their obligation of seeing to it that drivers are well informed. The motoring public is not well informed, and poorly informed drivers tend to have the most accidents. In a certain sense accidents are indications of educational shortages. Somewhere along the line we have failed to persuade drivers to study the regulations and follow safe driving practices. Curiously enough, in Connecticut the high school youngsters tested scored as high as the average Connecticut drivers with 16 years' driving experience.

*Improving Attitudes*—This and other studies have shown us that the attitudes of drivers are very important. We would even go so far as to say that attitudes are more important than driving skills. What can we do with drivers who give evidence of bad attitudes such as discourtesy, poor sportsmanship, "hogging the road," chance-taking, thoughtlessness, disrespect for law, and the many other faulty attitudes.

Improving attitudes is far more difficult than imparting information with regard to safe driving practices. Attitudes are apt to be deeply ingrained and not as easy to change as either knowledge or skills. But they can be changed. We are firmly convinced of this and have seen many examples of it.

In the first place, the interview conducted by a hearings officer provides an excellent way of changing faulty attitudes. This is true likewise when a commercial vehicle operator is called in following an accident. He must be persuaded through direction and through an analysis of his record, together with the findings of tests, that his attitudes are wrong. We must remember that many of our attitudes have been brought about by emotionalized experiences. A driver who "hates cops" and who will do anything to take advantage of situations "got that way" because of certain past experiences.

The suspension and revocation of licenses is another method of getting at faulty attitudes. The driver must be convinced that he is wrong and shown that if he continues his bad practices he will be ruled off the road. Supervisors of commercial fleets can see the application of this in their work. Good attitudes must be stressed continuously. Several of the new visual aids, such as the Zurich production "Destination Death," are devoted to improving attitudes.

*Emotional Instability*—What can be done for drivers who are emotionally unstable? Some suffer from mild or more serious neuroses; others, from the more serious psychoses. Some are worried about family and personal problems; others are anxious and upset about other difficulties. Under such conditions they do not concentrate. They tend to become upset in emergency situations, and an accident may follow. This is a difficult problem to deal with on a statewide basis.

Obviously, the more serious psychotic cases or those with bad neuroses can be referred to a psychiatric clinic or to the family doctor. But these emotional conditions rise and fall and are difficult to detect. Fleet supervisors have an important responsibility in their dealings with individual drivers to do what they can to clear up any "gripes" or emotional disturbances that they may have. Fortunately, certain of the tests we have used tend to show which individuals are maladjusted, but until the states have either social case workers or psychiatrists on their staffs, it will be difficult to give much help. A friendly conference with a clinic examiner may provide some help for this type of driver.

*Remedying Eye Defects*—Fortunately, many of the eye disabilities revealed in the study are subject to correction or may be compensated for. Drivers who fail on visual acuity tests obviously should be told to visit an eye specialist. Those who have low glare resistance should be cautioned about night driving. Those who have a restricted field of vision should be asked to have additional mirrors installed on fenders or sides of cars. Astigmatism and muscular imbalance can be corrected in many cases. When visual conditions are hopelessly bad, licenses should be revoked.



In this brief paper it has been possible to discuss only some of the high points of the problem of the accident-repeater. You will note that I have not talked about repeaters as being accident-prone. We feel that only a comparatively small percentage of the repeaters are accident-prone. We take the stand that a large percentage of the accidents involve some failure, some shortage, or some faulty practice on the part of the drivers.

While the so-called "physical" cause of the accident may be given as "on the wrong side of the road," "faulty passing," or "exceeding the speed limit," we are more concerned with the basic or underlying cause. "On the wrong side of the road" is only the last physical thing that happened before the crash. We are concerned with *why* the driver *got* on the wrong side of the road.

We are convinced that there are certain personality factors that are the underlying causes of most accidents. These factors can be located and measured, and in many cases corrected. Just as the health clinics are attempting to eliminate disease, the psychiatric clinics to treat mental ills, so driver clinics can help locate and correct many of the disabilities which contribute to accidents.

*Other Physical and Mental Disabilities*—Thus far we have considered only those disabilities that are essentially psychophysical. There are, however, a number of other disabilities that should restrict or exclude persons from driving. Mention of certain of these is made in the Uniform Vehicle Code, Article II. There is general agreement among administrators that persons suffering from epilepsy, unless they have certificates from their physicians to the effect that seizures have been eliminated, should be barred. Both *grand mal* and *petit mal* cases, if they are subject to seizures even though only occasionally, may be dangerous on the highway.

Those suffering from narcolepsy, who tend to fall asleep at the wheel, should be restricted. Obviously, the same is true of the more serious cases of spastic paralysis, locomotor ataxia, and paresis. On the contrary, the record of amputees and paraplegics, provided they drive cars equipped with special controls, appears to be satisfactory. As far as we have been able to ascertain, the driving record of the 17,000 veterans who have been given cars by the Veterans Administration is as good as and even better than the record of the non-disabled. In addition, those with minor orthopedic disabilities of the hand or below-the-knee amputations have as good an accident record as the normals.

Persons suffering from very high blood pressure and the more serious forms of heart disease should be cautioned not to drive, even though their accident record may be favorable. This is true especially of those with serious angina pectoris or coronary thrombosis.

There is no question about habitual drunkards and serious users of narcotics being barred from the highways. The difficulty is to locate them. Then there is the difficulty of determining which are the serious cases. Here, again, the advice of a physician is necessary.

What can a state do to restrict the driving of those persons with the more serious mental disorders? The answer is given in the Uniform Vehicle Code: The Department shall not issue any license to—

"Any person, as an operator or chauffeur, who has previously been adjudged to be afflicted with or suffering from any mental disability or disease, and who has not at the time of application been restored to competency by the methods provided by law."

This provision is in the Code, but there are many states that have not as yet adopted it. There are others who have it on the statute books but do not comply with it.

It is obvious that many of these conditions would not be located in an average clinic. As a matter of fact, most clinics could not, nor would they be allowed to, diagnose cases and prescribe treatment. However, some of the conditions would be apparent or could be located by means of tests.

In conclusion, the percentage of serious accident-repeaters in the average state is not large. Many of the disabilities of the limited number of repeaters can be located



and in most instances remedied. While this group is not responsible for any large share of the total accidents in the state, it is responsible for far more than its share. It is for the state or commercial fleet supervisor to discover who is disabled and attempt to effect a remedy or make compensation.

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## Round-Up of What's New in Traffic Safety


By NORMAN DAMON

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It is my purpose to deal with recent innovations that reveal that spirit of enterprise and action that has enabled the safety movement to advance in the face of all difficulties. Since more progress has been made in the reduction of traffic accidents post-war than in all the previous 50 years of motor vehicle use, let's confine our attention to this period. These phenomenal gains have brought us the lowest traffic fatality rate in automotive history, estimated by the National Safety Council for 1948 at 7.8 deaths per 100 million vehicle miles. That means about 15 million miles of driving for each traffic death. The fatality rate has been cut to less than half the 1931-35 average.

As to total traffic deaths, if the National Safety Council's present estimate of 31,300 for 1948 holds, then, with the exception of the war period, we must go back 16 years to find a lower annual total.

But fatalities are not the whole story. We must face the fact of a million crippling personal injuries each year. Nor can we overlook the two billion dollars or more, annually, wasted in accident costs.

Further, lest we become complacent, we face an enormously inflated traffic problem. Vehicles in use exceed 40 million driven more than 400 billion miles annually by more than 53 million drivers. In August of this year the 100 millionth vehicle was produced!

These figures should temper any overconfidence we may have or any feeling that the accident problem is licked. They should convince us we must be constantly on the search for new and improved ways to sustain the momentum we have gained.

We must use all the tools of imagination, science, research and training.

We must use better psychology than we have in the past. We can't scare people into being safe any more than we can scare them into being good.

Perhaps a more positive and effective approach is to appeal to both "pride and pocketbook." Because, after all, the mainsprings of safety are both altruistic and economic.

The developments I am going to review briefly cannot be classed as new in the sense of a new miracle drug like penicillin or streptomycin. Instead, they are in the nature of revised and expanded procedures, which have stood up under test and can now be put to work on a more comprehensive scale, with the aid of an aroused and rapidly growing public interest.

To simplify this round-up of what's new —or relatively new—I have used five major classifications: First, *program;* second, *machinery;* third, *activities;* fourth, *new problems;* and fifth, *new goals.*

*1. Action Program Basis for Unity*—Launching of the President's Highway Safety Conference in 1946 was a recognition by the highest department of government that traffic accidents constitute a serious social and economic threat to the nation. That action alone was the greatest single post-war stimulus to public interest.

Out of that conference came the Action Program—a pooling of all the most effective plans and techniques then available. That program has provided us with a common objective to which we can direct all our energies.

*2. Machinery Focuses Responsibility*—New—and newly effective—are the administrative procedures recommended in the Action Program, focusing the spotlight of responsibility upon official action, backed by an organized and articulate public opinion. Specifically, the blueprint provides:

a. For national coordination it provides a National Committee of Federal Officials; a National Committee of State Highway Safety Officials; and a National Committee for Traffic Safety.

b. For state coordination it provides for a Coordinating Committee of State Officials; and a state public support group or state safety council.

c. For city coordination it provides for a coordinating committee of city officials, and a city public support group or local safety council.

*3. Activities*—In discussing activities, it is often difficult to draw a clear line of demarcation between those that are official and those that are non-official. We recognize as a basic principle of the nation-wide effort that accident prevention is primarily the responsibility of the public officials entrusted with the legal authority to build, maintain and operate the highways and control their use. But in many cases a program is a thoroughly cooperative venture, both in conception and development.

In choosing the following examples of official and non-official action, there is no desire to be arbitrary. They are merely intended to illustrate types of programs in which the initiative and basic effort has been supplied largely by one or the other of the two elements—the public agencies and the public support groups.

Recently public officials in the states of Arizona, Michigan, Iowa, Colorado, Texas, Indiana, Oklahoma, Kansas, South Carolina, and in the cities of Miami, Fla., Lansing, Mich., and Washington, D. C., have undertaken comparative studies of their traffic laws and ordinances with the Uniform Vehicle Code and the Model Traffic Ordinance. The purpose is to determine to what extent existing laws conform to nationally accepted standards and to provide a factual guide for such legislative action as may be necessary to revamp the laws for the sake of consistency, safety and convenience.

A special committee of District of Columbia Commissioners Traffic Advisory Board has just completed a revision of the traffic and motor vehicle regulations for the district. This action is to be formally approved by the full Board and then forwarded to the Commissioners and the U. S. Congress for approval.

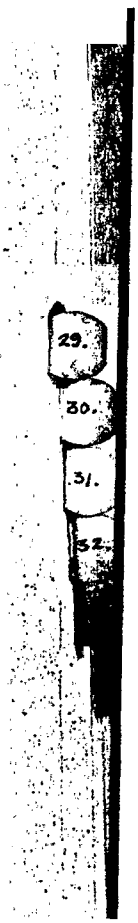
This leadership by officials of the nation's capital is especially significant, since more than 51 per cent of the vehicles on the streets of Washington, D. C., are from the 48 states. The Public Roads Administration has recently approved the use of Federal Aid funds for such state and local surveys.

Many private groups, incidentally, have initiated aggressive public-information programs to support the adoption of uniform laws and ordinances throughout the nation.

I'd like to underscore the importance of this effort by citing a single example. A study on law enforcement conducted by the Legislative Council of the State of Wisconsin observes that a driver with a broken headlight, traveling the 113 miles between Appleton and Madison, would be subject to arrest by 41 different enforcement agencies in 37 different jurisdictions.

This points up not only the duplications and conflicts that may exist in the traffic laws which the states and cities have been haphazardly accumulating over the years, but also the urgent need for coordination of our administrative agencies. In other words,





uniformity of application goes hand in hand with uniformity of statute.

Within the past three years the states of California, Michigan, Washington, Oregon, Kansas and Nebraska, among others, have undertaken a long-range survey of their highway needs. These engineering and fiscal studies are designed to provide the essential facts on which to base a sound and orderly road program, with due consideration to future population growth and anticipated increases in traffic—a program that will insure that highway funds, limited as they always are, will be so used as to give the public the greatest possible return in services and safety for every dollar spent.

Each report includes a review of the current traffic safety program based on the annual traffic safety inventory administered by the National Safety Council. Deficiencies in the state's program point the way toward stepping up the use of essential engineering safety-design features as well as other traffic safety features of the Action Program.

In September, the American Association of Motor Vehicle Administrators held a driver license examiner workshop at Michigan State College and developed the foundation for an advanced program in the treatment of the accident-repeater.

The association plans at an early date to initiate a national program for the training of chief examiners, to be followed by regional training for examiner instructors.

Few will dispute that a drastic revision and upgrading of our driver licensing procedures would be the most effective single measure we could take for the short-term (and certainly the long-term) improvement of the traffic accident record.

About two years ago the Commanding Officer of the North Carolina State Highway Patrol went before the Legislature with a plea for more men. He promised that for every officer given him he would save one life in traffic.

Given 225 more men, he set out to attain his goal and wound up a year later with the record showing 210 less fatalities; and to date this year a further saving of more than 100 lives, when compared with the 1947 total.

The Texas Highway Department has cooperated with half a dozen cities during the past year on measures to incorporate safe street-design features in the layout of new residential areas.

The Public Administration Service will shortly publish a brochure, "Building Traffic Safety into Residential Developments." This new manual has been prepared by a special technical committee for the National Committee for Traffic Safety.

Indiana now requires that doctors report to the State Board of Health, and they in turn to the driver licensing authorities, all cases of epilepsy or chronic drug addiction.

The Kansas Highway Department and the Iowa Department of Public Safety have both concentrated on locating and correcting "bad locations."

For example, on route 66 which crosses the southeast corner of Kansas is a 13-mile section, where motor vehicle fatalities, personal injuries and property damage totaled up to a financial loss of $274,000 during a four-year period. This figure is based on $15,000 recoverable per fatality, $2,500 per serious injury, and $250 per minor injury, plus actual property damage.

The significant thing is that, according to expert opinion, virtually all future accidents of the kind that have been happening could be eliminated through the expenditure of a sum no larger than the 4-year accident costs to correct existing hazards on the highway.

More than 400 cities and towns and 21 counties throughout New Jersey, with the assistance of the Motor Vehicle Department, have established official traffic safety committees in accordance with the Action Program.

In addition, the weekly radio dramatizations sponsored by the Department of Motor Vehicles have proven so effective that they have been adopted and adapted for use in three states and the District of Columbia.

Under the new constitutional court reorganization, the Chief Justice of the state has set for November 30-December 2 the first statewide traffic judges and prosecutors training conference ever held in the United States.

Four regional judges' and prosecutors' training conferences have been set up and staffed jointly by the American Bar Association and the Northwestern University Traffic Institute at Northwestern University, University of California at Berkeley, Tulane University and New York University.

In Connecticut, new reflectorizing material is being used on all vehicle registration tags. In both Connecticut and the District of Columbia, virtually all street warning and directional signs utilize this material.

Arizona has used it to delineate both day and night speeds on a single sign by a clever masking procedure on the figure "60" (daytime speed) to show the reduction to "50" (nighttime speed).

I trust I may be forgiven if I do a little pointing with pride to Washington, D. C., which, by its effective program, has brought traffic fatalities down to the lowest figure in its history.

The District's action in developing uniformity of rules, regulations, signs and signals may well give major impetus to the drive for uniformity throughout the nation, having as it does the special approval of the U. S. Congress and affecting hundreds of thousands of drivers who annually visit the District from the 48 states.

Intensifying its pedestrian protection program, new "Watch For the Light" rubber strips have been placed in the pavement at all important downtown intersections. Especially for people like myself with bifocal glasses this is the most effective possible location, since in watching for the step-down from the curb, one actually sees this warning before looking at the light.

In common with many states, the District police and traffic division runs a traffic violators' school. In addition, however, the District is probably the only city or state that runs a special school to educate its traffic prisoners. The Department of Motor Vehicles, cooperating with the police and Department of Corrections, conducts weekly classes in the District Jail!

The sign modernization program calls for the immediate erection of 75,000 signs and signals conforming with accepted national uniform standards (All Federal highway markers carry a new and highly effective reflectorizing material).

The first training school for driver examiners will be held in the District in November. One feature is the new written driver examination which is certainly one of the few, if not the only, such examination devised with the aid of psychologists and psychiatrists.

And so it goes in state after state and city after city.

In Dallas there is a juvenile court on Saturdays and a clinic at the County Hospital for those apprehended while driving under the influence of liquor; in Grand Rapids, Michigan, special intersection analyses are made to ascertain "cause" rather than "circumstance" of non-observance of lights and signals resulting in accidents.

Mississippi inaugurated a special vehicle-light checking program; Portland, Oregon, set up bicycle stands to keep pedestrians and bicycles apart. The same city marks certain street crossings as "suicide lanes."

In first place among non-official activities supporting the Action Program, one must certainly rank the Annual Inventory conducted by the National Safety Council.

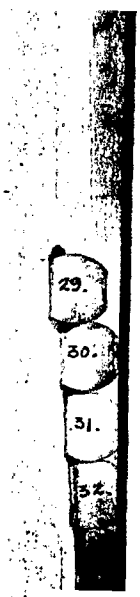
Through this inventory and the subsequent technical analyses, state and city officials and public support groups have ready at hand not only a progress report on past accomplishment, but a comprehensive program for the next year's job of traffic improvement.

Five special emphasis programs have been approved by the National Committee for Traffic Safety as a means of giving concentrated and timely support to specific activities. Thus high school driver training was selected as the first this Spring; driver licensing this Summer; with traffic court improvement, uniform laws and traffic training to follow.

On October 16 a meeting was held in Chicago that promises far better integration of field staff support for the Action Program than we have had in the past. More than 20 national organizations met to exchange information on basic functions, their current safety activities, and ways and means to utilize their respective field forces so as to get more effective coordination and maximum results in support of the entire action program.

Certainly adequate information is the keystone of public support. Action and sup-





port will only follow on the basis of such information.

In a recent special study at the New York University Center for Safety Education comparing accident-repeaters and accident-free pupils, there was found a significant variation of nearly 8 points in safety knowledge favoring accident-free pupils. Small though this straw be, it points definitely to the need for a greatly stepped-up public information program.

To the collection and dissemination of essential safety information, public and private safety officials alike must dedicate their efforts.

Within a little more than a year through the development of Operation Safety, the National Safety Council has forged a powerful new tool creating public awareness of the traffic accident problem. The influential aid and support of the advertising industry has been mobilized through the Advertising Council. Concentration on "the hazard of the month" has provided local groups with a specific "one-shot" service to traffic safety in their communities.

We are definitely improving other machinery for public information and public support.

There is the National Committee for Traffic Safety, comprising in its membership some 85 national organizations.

There are the newly formed National, State and local Inter-Industry Highway Safety Committees, sponsored by the automobile and tire manufacturers and automobile dealers.

There are the state and local committees sponsored by the National Association of Insurance Agents.

There are a growing number of effective state and local safety councils.

In Des Moines, Iowa, the "Hey, Bob" safety legion has enlisted 11,000 youngsters from kindergarten to junior high school. Every Saturday they meet as a junior safety council via radio.

Ohio automobile dealers are teaching safety with comic books; Pennsylvania dealers with animal cutouts. Kansas used a series of blackboard safety messages to greet school children at the beginning of the fall school term and California has made effective use of vehicle instrument panel reminders. Chicago and Detroit are conducting police precinct safety contests.

The Oklahoma City Safety Council has developed a safety speaker's manual which should be of inestimable value in developing neighborhood support for traffic safety.

I might go on indefinitely citing illustrations of the many things being done to create safety-mindedness in motorists and pedestrians through public information activities. All of you have doubtless sensed the groundswell of new interest in traffic safety on the part of the various informational media—the recent articles in the "Saturday Evening Post" and other magazines on driver licensing; the greater prominence of safety features in the press, and the increasing amounts of radio time being devoted to accident prevention.

I want to call your attention, also, to the new Alfred P. Sloan Radio Awards for Highway Safety which will doubtless open up to public support groups much greater opportunities to use the facilities of broadcasting in their public safety activities.

Possibly the most important single step that has lately been taken in the area of public information is the use of public funds to conduct a regular program of activities. Dallas, Texas, appropriated $25,000 for such public information work. Washington, D. C., and Cleveland, Ohio, are other examples of cities that are using public funds in a conscientious effort to alert the public to safety through the most suitable informational media.

In Washington, D. C. these public funds have permitted the employment of a full-time worker in the local application of Operation Safety. More than 30 television shows have been scheduled using children. Likewise, the service of a blimp has been secured to display a flashing neon traffic warning; monthly movie trailers have been developed; menu cards that carry the monthly operation safety theme, and even the weather report given over the telephone now includes a traffic message.

Connecticut's Motor Vehicle Department similarly is taking leadership in using television to inform motorists and pedestrians of current traffic hazards and helps.

Three other new award programs deserve mention. There is the High School Driver Award program sponsored by the Association of Casualty and Surety Companies which, in conjunction with the National Traffic Safety Contest and the National Pedestrian Protection Contest, will serve to assemble the facts for the Annual Inventory.

The first annual Beecroft Award for outstanding service to traffic safety was made last year to Paul G. Hoffman; with the second award going to Commissioner Thomas H. MacDonald this year. That program is administered by the Society of Automotive Engineers.

The American Bar Association has instituted an annual award to the city making the most progress in traffic court procedure and practice.

Through a grant of funds from the Alfred P. Sloan Foundation the Yale Bureau of Highway Traffic is studying some of the administrative problems involved in the effective application of traffic engineering measures.

Professional traffic training has been stepped up enormously. Plans now include concentration at regional traffic training centers with expansion of the number and type of courses offered.

The First Western Regional Training Institute will be held at the University of California at Berkeley, California, January 31-February 11, 1949, patterned after the National Institute for Traffic-Training.

Northwestern University in July, 1949, will inaugurate the first such regional training institute in the midwest.

More than 500 persons took part in four statewide traffic engineering training conferences sponsored by the Institute of Traffic Engineers this past summer.

During the current year, more than 100 short courses or training conferences will be held in a wide range of specialized traffic control and safety functions.

A recent survey by the National Education Association of college and university safety activities shows a remarkable spread of training, research and participation in this field.

Motor vehicle fleet supervisor training courses have been developed and last year were held in 33 universities and colleges in 32 states.

The California Legislature has appropriated $350,000 for the establishment of a permanent Institute of Transportation and Traffic Engineering at the University of California.

Similar strides are being made in the field of police traffic administration. Three different colleges have resumed their full four-year undergraduate courses. One of them, Michigan State, has an enrollment of 148.

The Chief of Police of Dallas has just instituted a 44-hour driver training schedule for all traffic police recruits. This is certainly one of the first, and perhaps the only such program in the country.

Increased safety and efficiency in the operation of school buses centering around the selection, training and supervision of the driver was the objective of the recent national school-bus conference at Jackson's Mill, West Virginia, sponsored by educational organizations and administered by the National Commission on Safety Education.

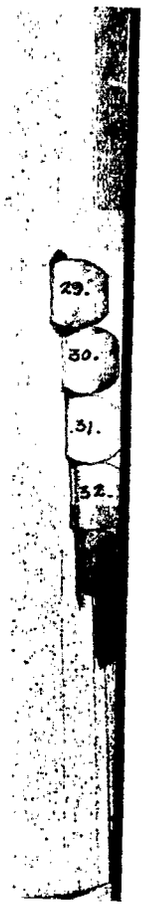
West Virginia also is pioneering with a statewide school-bus drivers' safety council with more than a thousand members.

In Bradford, Pennsylvania, the McKean County AAA Motor Club helped initiate a new type of high school assembly safety program, based on practical information about the causes of accidents. The moderator was the school principal and participants included president of the student council, a state patrol officer, an insurance company claims agent and the high school driving instructor.

Actual accidents were reviewed, as were the claims paid out on them and the reasons why the accidents happened. Subsequently the entire school assembly participated in the discussion. Needless to say that program was a lively one and difficult to shut off.

Further impetus to safe driving by teenagers has been provided by the new "Man to Man" agreement for father and son or father and daughter, sponsored by the National Inter-Industry Highway Safety Committee. First developed in Michigan by the Detroit and Michigan Automobile Dealers Associations, the agreement is being recommended nationally by the Inter-Industry Committee and the National Automobile Dealers Association.





At Pershing High School in Detroit, the driver training grounds, equipment and instructors are utilized on evenings and Saturdays to give adult instruction on a fee basis.

In North Carolina, nearly 75 per cent of the school buses are now driven by high school students, many of them girls. The state's record for safety is outstanding and its cost per student only about one-fourth that for the highest state. Part of that low cost can be attributed to an original idea in the training program whereby a qualified "mechanic instructor" rides with the trainee for part of the training period to insure proper instruction in the handling of brakes, clutch, steering mechanism and other parts where bad handling increases maintenance cost.

Many new problems are immediately ahead. For instance, what to do about motor scooters, powercycles, small cars and new types of automotive vehicles?

There is an ever-increasing volume of automotive farm equipment using the highways. There is a rapidly expanding and dangerous "ribbon" development of new homes closely crowding roads that must be widened or growing traffic volumes shifted to other routes.

There is the inevitable fact that the continually increasing overload on our streets and highways will just as surely result in costly congestion and accidents.

Other problems are aggravations of old ones. There seems to be an increase in the popularity of that national pastime, drinking and driving. The little town of Berlin, Connecticut, reports alcohol a dominant factor in five out of seven fatalities for the first seven months of this year—an all time high. According to figures compiled by the American Association of Motor Vehicle Administrators, four out of every ten operators who had their licenses revoked last year were guilty of driving while under the influence of alcohol.

Nevertheless, corrective measures are being brought into play. It is reported that all but one state now permit the use of chemical tests for intoxication as evidence in accident cases. The National Safety Council, Northwestern University and Michigan State University are concentrating on this problem with a special grant of funds.

Finally, isn't it time we quit screaming about lack of public support? For one, I believe public support is way ahead of us and is asking simply—what do you want us to support?

The fault, I believe, lies in the lack of adequate machinery by which the tremendously unused power of now-dormant public opinion can be utilized for the public good.

In a small way here and there, we are beginning to scratch the surface of these possibilities. For instance, here's an example reported by the Executive Director of the Virginia Governor's Highway Safety Committee:

"In one of the city councils the people were encouraged to become traffic engineers and mailed their suggestions and criticisms of the traffic situation in the community to a certain post office number. Effective responses overwhelmed the clerical help and the Police Department was able to use many of the suggestions."

In how many other communities do either the public or private agencies dare invite such action—or will they continue to say, "Papa knows best"?

From California, the Executive Secretary of the State Coordinating Committee, reports:

"A new technique in commercial driver conferences is being tried in California, the first being handled in Sacramento very effectively.

"These drivers were invited to attend six weekly meetings presided over by an official from this organization. Each week an expert in some phase of safety would talk for fifteen minutes, and then the meeting would be thrown open for discussion. Both state and city traffic officials were present to answer questions and the drivers were urged to express themselves freely. The meetings were scheduled to last for one hour and never broke up under one hour and a half. They were well attended, and all drivers expressed themselves as delighted with the opportunity to talk freely on their problems. We hope to extend this procedure to other communities."

In his book, "A Little Democracy Is a Dangerous Thing," Charles W. Ferguson says:

"The mass of persons concerned with almost any enterprise, whether it be the stockholders of a large corporation or the constituency of a university or the membership of a religious body, is looked upon as a rabble which must be sold on this or that idea which management initiates. . . .

"The depressing consequence to be seen on every hand is that the business of the world is being carried on in the candle power of executive minds rather than with the immense power that might be generated by the dynamos of democratic action. . . ."

What I propose therefore is a new and bold democratic approach. What we might well try is an actual referendum—not a poll—for use by a state or by a city. Let the people express themselves on each traffic issue as it comes up. Then we can find out whether the popular will, for example, is to send drunken drivers to jail or to turn them loose.

When we know the real answers to such questions as these we can then provide ourselves with exactly the amount of traffic safety we want and are willing to pay for.

Let some courageous city or state safety council select an issue—such as whether or not to institute high school driver training—provide the public with adequate information about all aspects of it—and then, after a reasonable period, put the issue to a vote. The radio and the newspapers doubtless would be glad to provide the facilities for such a novel and worthwhile project.

When we start acting along these lines, I believe we will begin to develop full public responsibility based on full public participation in traffic safety.

Only then, I believe, will we begin to stir men's imaginations with one of the greatest of all activities for the common good—the saving of life, limb and property.

Only then we will approach that high goal set forth by William James:

"What we now need to discover in the social realm is the moral equivalent for war; something heroic that will speak to men universally as war does, and yet will be as compatible with their spiritual selves as war has proved itself to be incompatible."

So much good additional material was provided by various sources in connection with this talk that some of the most noteworthy items have been summarized briefly.



Automobiles from two of the worst wrecks in the county were exhibited at an outside tent sponsored by the Sheriffs' Department at the Allen County, Indiana, Fair. Inside the tent were blown-up photos of wrecks and safety posters.

Scooter driving is being taught in Arizona.

The Arizona Accident Prevention Council uses "orchids" instead of scallions for drivers. If executive officers notice examples of good driving or have notice of acts of courtesy by drivers, a formal letter of commendation is sent to the owner of the car.

In Arlington, Va., school children are checking up on the traffic violations of their elders between now and Christmas—reversing the old technique of inducing good behavior.

In Chicago old and unsafe cars were junked at a huge bonfire, following a parade and formal ceremony of tearing up certificates of title by the Mayor.

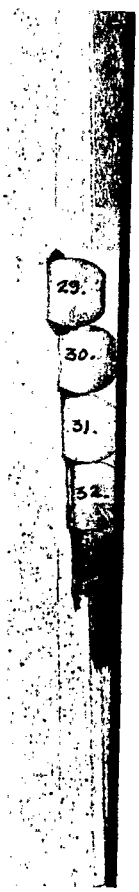
A pictorial presentation of its coordinated traffic safety program has been developed by Colorado, as well as localized accident spot maps suitable for unlimited reproduction.

A condensed version of the Concord, N. H., traffic regulations was sent out by a local electric company in its bills to 8,000 customers.

A bicycle ordinance was passed in Eau Claire, Wis. A bicycle panel of 20 members was set up to observe practices of riders who are warned of violations. Violations of a serious nature call for appearance at a special bicycle court the following Saturday morning. The judge of the bicycle court is the only adult connected with this work and is a police officer.

A public opinion survey in Evansville, Ind., shows that poor driver performance more than any other factor is held chiefly accountable for traffic irritations.

School children were sold on safety during a special event sponsored by the Fort Wayne, Ind., Police Department at the local amusement center. Grounds were



opened early and rides priced at 5 cents for children of school age. Local merchants donated prizes for contests. Ten thousand children were drawn to a central stand for an occasional penny scramble. The opportunity was then utilized by the Police Department to get across a safety message.

In Fort Worth, Tex., the Lions Club had two blind men with their seeing eye dogs walk the street during a pedestrian safety campaign with a printed sign reading: "We watch where we're going—why don't you?"

Ten thousand safety buttons were distributed by Fort Worth Safety Council during pedestrian safety week.

Fort Worth is also engaged in direct mail fund solicitation for safety activities.

A "talking" safety car is used by the Indianapolis Police Department.

A "Jay Bird" was used by the Jacksonville, Fla., safety council to follow jaywalking pedestrians!

Kansas City, Mo., merchants permitted painting of the Green Cross for Safety symbol on store windows with an oil paint for the period of the campaign.

In Los Angeles a character called "Droopert" has been used to illustrate doing everything the courteous way. Last year the same character did everything the wrong way.

Two radio scripts are prepared by the Coordinating Committee of State Officials on Traffic in California about the 5th and 20th of each month. These are sent to highway patrol captains in communities where there is a small radio station glad to get "live" broadcasts. All scripts are based on highlights in traffic safety and always bring some organization before the microphone along with the highway patrol captain.

"Angels" in the persons of attractive young women were used by the Longview, Wash., Federation of Business and Professional Women to hand out warning messages to persons crossing against the red lights.

Attendance at the traffic violator school held regularly by Maryland's Motor Vehicle Commissioner is a prerequisite to restoration of suspended driver licenses.

Michigan is now telling persons convicted of traffic violations that the state or city doesn't want their money—but it does want safe driving. Traffic courts in 61 cities in that state distribute leaflets to this effect to all violators.

A "Help a Ride a Bus" program has been developed by the City of Milwaukee Safety Commission in conjunction with the Transport Company. Buses were taken on the school grounds and the entire school went through the proper procedure under the guidance of properly trained supervisors.

Newspapers are being urged by Minnesota Safety Council to report "causes" rather than "circumstances" of accidents.

Gasoline service stations in Mississippi cooperate with a Mississippi Highway Safety Panel in having filling station attendants check lights and brakes on all vehicles as an added service.

Higher speed limits produced lower average speed through small Nebraska communities on main trunk highways. An experiment was tried by raising the speed limit from 25 miles to 40 miles with three results: first, a speeding up of slow traffic; second, a slowing down of fast traffic, and an increase of the percentage of total driving within the limits set.

In Oakland, Calif., metal signs on light poles warn, "The short cut is the deadly way."

Fake pedestrian accidents were staged by having an "angel" hit while jaywalking.

Mr. Grim, a skeleton draped in cloth, was mounted on a stand on a business district street corner. Concealed public address wires were run into an adjoining building. Jaywalkers were then admonished by Mr. Grim from daily changed locations, with rather startling results.

The Oklahoma State Safety Council has worked out a plan with the Oklahoma Press Association, both for fund raising purposes and to stimulate individual interest.

Bicycle racks placed on Portland, Ore., streets at points where bicycles have proved to be a problem are used to display safety posters. Similar posters with special messages against driving or walking and drinking are posted before state liquor stores.

A women's driver clinic with excellent interest and support is a feature of the Portland, Ore., program.



Scotchlite cloth, one yard to a person, distributed by the women of the St. Joseph, Mo., Safety Council throughout the community as demonstration. This was given to Girl Scouts, Boy Scouts, Public Utility Service men, blind persons, old people and others who asked for it. Instructions were that the material was to be worn on coat cuffs, collars, or lapels.

Simulated traffic "tickets" were used by St. Joseph Safety Council for special messages.

"Take One" boxes were also put up in many public places by the St. Joseph Council for distribution of safety material.

Kindergarten and grade school teachers in the same city were visited by the women's division and presented with material containing a song, "Sing a Song of Safety," with effective use by, and interest of, children.

Special pictures were posed by the St. Joseph Chief of Police for publicity purposes, to show three illegal and dangerous positions of the arm outside of the car.

In South Dakota the head of the state patrol, whose small force had been having trouble with stop sign observance, got out of his car to congratulate a driver stopping at such a sign. Imagine his surprise when the driver reported he was out of gas and wanted to be pushed.

Outdoor poster cards promoting safety are used at strategic points in Spokane, Wash., and Detroit, Mich.

Several hundred Boy Scouts, equipped with long rods to which are fastened small pieces of red cloth, help to control holiday pedestrian traffic in Utica, N. Y.

Safety fund raising coupled with a voluntary brake-testing campaign over a two weeks period in May was sponsored by Utica Safety Council. Attractive young women were stationed at testing points to solicit voluntary contributions for safety.

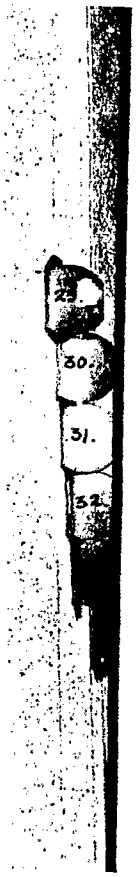
"Horror" boards with hard-hitting pictures and the words, "The Virginia Accident Situation," are used by Virginia Governor's Highway Safety Committee.

A one-act safety play contest for high schools is being conducted by the Committee.

In addition, this Committee, in cooperation with the State Department of Conservation and the Department of Highways, posts large markers at entrances to the state to show panoramic views of interest to tourists within a 100 to 150 mile radius of that point. Small replicas with safety messages changed monthly are to be placed in hotels, restaurants, etc.

Annual bicycle rodeo programs were conducted by the District of Columbia, AAA Motor Club, District Recreation Club, Metropolitan Police Department and Child Traffic Safety Council.

Driver reward programs have been tried successfully as stunts in a number of cities including Washington, D. C., Cleveland, Ohio, Indianapolis, Ind., the ten East Bay, California, cities and by the California Highway Patrol.




## Police Specialization

By B. R. CALDWELL
Deputy Chief of Police, Los Angeles, Calif.

"Police Specialization" is a general phrase that has received an abnormal amount of attention during a comparatively brief period of time. The present interest in specialization may be attributed to several factors, chiefly among those being vigorous and far-sighted leadership of professional police officials encouraged to utilize all available modern scientific implements and methods in conscientiously accepting a growing challenge to provide more effective and efficient public service.

Specialization in police operations is not a new venture. It has been a developing activity dating to the initial establishment of a recognized police organization.

Beneficial results achieved through a specialized approach have become so well known that the techniques originally applied and upon occasions spectacular in nature have been accepted as standard practice in general police functioning. Attention is now directed to these forms of specialization only when refinements are perfected or when an unusual approach is discovered.

It may be significant to observe the survival of special units originally designed to execute these peculiar or extraordinary tasks.

"Police Specialization" is currently receiving additional attention and the prominence may at least partially be traced to emphasis on traffic control, considered to be one of our major modern problems in police administration.

It may be true that foresight would have more advantageously established traffic control as a public service to be provided by a less repressive agency than the police. However, it is pure speculation to assume that any agency could have anticipated traffic growth with sufficient accuracy to provide the most adequate control features in advance of or coincidental with the emergency demand.

Injection of the motor vehicle into modern social and professional life and the rapidity of traffic growth has revolutionized police procedures, both in additional police demands and ability to meet them. Factors leading to police specialization in traffic are fundamental and well recognized.

A considerable number of police administrators enjoy entertainment of the theory that police personnel can be sufficiently trained to adequately dispose of any field problem with which they may be confronted.

Many police administrators have recognized that the most efficient public service cannot be achieved by sole reliance upon this theory, particularly where demands for public service are overwhelming.

It has been discovered that under these acute circumstances, well trained groups whose activities are primarily devoted to major pressing demands can economically be deployed to the decided advantage of agencies involved.

The Los Angeles Police Department provides in its organization for a traffic bureau. Because of this theoretical separation from general police activities, an immediate inference may conceivably be drawn that traffic men under these circumstances are divorced from concern over other police activities. This is far from true. As an illustration: 49 per cent of field calls answered by traffic men in our department are in relation to non-traffic events.

The Los Angeles Police Departmental policy further provides that operation of the traffic bureau does not relieve division commanders of their responsibility for traffic control within their respective districts. It is emphasized that the Traffic Bureau is a specialized function designed to supplement the general police activity of the patrol divisions. Under this arrangement most accidents are investigated by special units and the major burden of traffic enforcement is assumed by our primary enforcement group. The traffic bureau investigates approximately 90 per cent of all reported accidents that are actually investigated and contributes 75.0 per cent of all traffic law enforcement.

Using authorized figures as the base, attention is invited to the fact that 22½ per cent of our total sworn personnel is allocated to the traffic bureau. This personnel is distributed to four divisions: accident investigation, traffic enforcement, parking and intersection control, and service section. The first three divisions are each commanded by a captain of police, and the last one by a lieutenant of police. The service section is composed of four units, each supervised by a sergeant of police:

1. Analytical unit.
2. Educational unit.
3. Photography unit.
4. Special events.

Establishment of the Bureau gave rise to the usual predictions accompanying specialization. This has been revived upon each approach to refinement.

In view of tasks performed by the traffic bureau including all phases of general police work, excellent training is provided thereby for our traffic officers to creditably produce in any field of police activity. There appears to be none of the evil results allegedly born of specialization. Net results are gratifying and upon final analysis, this seems to be the most effective test.



# Police Specialization

By EDWARD J. HICKEY
Commissioner, Connecticut State Police, Hartford, Conn.

Presented by SGT. LESLIE W. WILLIAMS
Connecticut State Police, Hartford, Conn.

For a considerable period of time police administrators have engaged in lengthy discussions of the pros and cons of specialization and a great deal of misunderstanding of the subject has been the result. Some of this confused thinking has arisen from discussions of the evils of over-specialization. Naturally, overdoing any good thing invariably leads to bad results. We do not condemn eating because over-eating is an evil. So it would be with specialization. It has its place in any modern police department and has been used with great success for many years.

Proof of the harmful effects of over-specialization and the results of improperly administered specialized services have clouded the issue and resulted in much opposition in spoken and written opinions by police administrators who are at the same time utilizing specialized police services in their own departments every day. The detective, the fingerprint expert, the photographer, the desk man, and the accident investigator are all specialists devoting a part or all of their time to a particular line of work.

I doubt whether anyone would argue against some degree of specialization in any but the very smallest department, and so I believe that the question is one of the degree to which specialization should be developed and a determining of the extent of such division of effort.

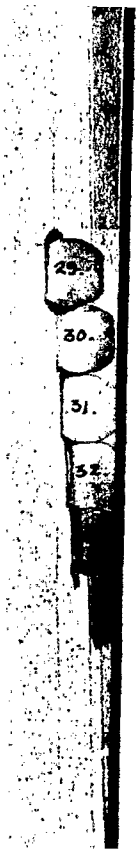
It is the duty of every police administrator to utilize to the fullest extent of his ability and in the best possible manner the resources placed at his disposal. The right man in the right job is an age old maxim which may be applied in any department. We readily admit that each man under our command has different aptitudes and abilities, different interests and experiences. Specialization recognizes these differences and utilizes to the fullest extent the special talents of the individual. Only in this way are we using the available man-power resources in the best possible manner.

In smaller departments this may mean part time specialization but it is an application of the same principal. In that case the administrator is making the best possible use of the individual talents of his men according to conditions.

All of us who have spent the greater part of our adult lives in the police profession will recognize the growing complexity of police work. The degree to which specialization is necessary is governed to a great extent by this growing complexity. It is impossible for any one individual to be a master of all the techniques and specialized tasks required of a modern police department. Jack of all trades and master of none might well be applied to the police officer who attempts to meet all of the demands placed upon the police officer of today.

Whether or not there is any planned program of specialization, some degree of special functions is almost certain to develop in any police department of any size. It is a natural thing and it certainly is desirable. As Bruce Smith puts it—"such specialization permits training in highly developed skills and development of a degree of expertness which could not otherwise be realized." This can be referred to as the pro side of the discussion. Rather than the jack of all trades we have the master of one skill who applies his special talents and abilities to the best advantage.

The growth of a department brings with it a division of activities with the resulting specialization. In the large metropolitan department the detective divisions are further divided as to the type of crime each investigates. This type of specialization would certainly be classed as over-specialization in most state police departments and in many city departments. Thus it is an ad-



ministrative problem as to how much specialization may be undertaken.

In my own department different areas of the state present varied demands for police services resulting in a grouping of personnel according to individual abilities and interests. One station for example, has a great deal of patrol activity on express highways with a minimum of investigative work due to the coverage afforded by many city departments in that area. Men who are assigned there are those with an interest in traffic work as far as is possible. In another corner of the state, a rural area with a minimum of highway work, the men are used mostly in the investigation of rural crime and the same policy as mentioned previously prevails. Men who have investigative ability and are interested in this type of work are needed here and assignments are made with this in mind. Thus we have in effect an elementary form of specialization according to the character of the area covered.

In addition to this elementary form of specialization, we also have a special service or detective division which moves throughout the state in the investigation of special crimes, a traffic division composed of men with special training at the Northwestern Traffic Institute, an emergency division with its special equipment to meet the demands made for such service, a Fire Marshals Division, an Identification Bureau, and various other specialized services administered from the state headquarters.

In each of these sections men are selected because of special aptitudes and training to fill these positions. The rest of the department recognizes the necessity of such specialization and readily utilizes the services offered by these divisions.

In addition to this there is specialization within each barracks area. Station desk men, photographers, fingerprint men all represent a necessary form of station specialization. Here again ability and special training, most of which is made available through in-service training courses, is made the basis for the selection of these men.

Any greater degree of specialization in my own department, I feel, would result in a condition of over-specialization. In a state police department each individual must be trained to meet situations which require a high degree of individual training in many of the techniques which would be classed as specialties in a large city department. This is true to an even greater degree in other state police departments where the man power is spread thin over large areas.

Thus it is that each administrator must judge for himself as to the degree of specialization which will result in improved police services to the people his department serves. That is the basic reason for such division of tasks, assigning to each that which he is best fitted to handle for the good of the whole department. As the ability of the individual to provide a needed specialized service increases, so the efficiency of the department increases for the work of any department is the sum of the efforts of the individuals who make up its personnel.

Specialization imposes many administrative problems which must be met and solved if the proper results are to be obtained. The selection of the right man for the specialized task is the first step. Something must be known of the abilities and interests of the individual before a proper selection can be made. Opportunities for further training must be made available if such is needed.

A constant supervision is necessary so that there may be no weakening of the individual sense of responsibility for seeing that the entire task is properly performed. When the specialist loses sight of the primary task of providing proper police service at all times and becomes engrossed in his specialty to such an extent that he is no longer a complete police officer he must be promptly set straight in no uncertain terms. Such an erroneous attitude on the part of the specialist is often cited as a potent argument against specialization but is, I believe, strictly an abuse which should be detected and eradicated by the alert administrator.

Some friction may develop within a department between a specialized service and the men assigned to general police duties. Here again there is a problem of detecting the cause of the trouble and applying stern measures to end it for the good of the entire department. This too is a problem of command and is usually the result of misunderstanding and petty jealousy within the ranks. It is not the result of specialization but is due to the nature of the personnel. There are always those in the ranks who, in their own words, are entitled to recognition which they believe they are not receiving.

In closing and by way of summary may I say that experience has proven to me that specialization, properly initiated and executed, is a necessity in the modern police department of today. All departments specialize to some degree. It is necessary due to the complex nature and the wide variety of services demanded of a police department. It recognizes the special abilities and aptitudes of the individual and utilizes them for the provision of improved police service to the public. It does impose certain administrative problems in determining the nature and extent of the specialization desirable, and in the planning and execution of the plans for such service.

Every police administrator worthy of the name owes it to the public he serves to provide as much specialization as is needed and desirable, to provide the type of service which is expected of the police profession.



## Police Specialization

By RICHARD R. FOSTER
Director, Department of Public Safety, Richmond, Va.

Police specialization is in the same category with the question of one-man or two-man cars and the old and ancient controversy regarding the hen and the egg.

Some years ago when law enforcement was first beginning to feel the growing pains of modernization and it was necessary to start practically from scratch in the matter of training and reorganizing, a great deal of emphasis was placed on specialization, which at that time was very new and and very interesting and intriguing.

Up to then, except in rather rare instances, specializations or specialized skill in any particular phase of law enforcement was something an individual acquired more or less by inclination because the particular skill involved interested him. Generally speaking a policeman was a policeman. He pounded a beat and maintained law and order after a fashion and to a great extent avoided the technicalities with which present day police officers are so thoroughly familiar.

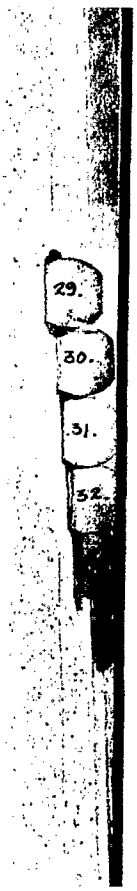
With the coming of modernization and the necessity for training in special phases of law enforcement, it was obviously necessary to concentrate on certain men with the necessary aptitudes since specialization then was a brand new field. However, being human beings, as well as law enforcement officers, too many of us went overboard, with the result many of our departments became over-specialized in certain branches, with the result that the remainder of the department considered the so-called specialists as being the "fair haired boys," and also being human themselves too many times acquired the habit of referring everything possible to the specialists.

Another result was the ever increasing size of special branches of police departments, such as detective divisions and traffic divisions, which in one sense was necessary, since at that time all the rest of the force referred any special matters to them and pretty much refused to have anything to do with them.

It eventually became evident that some sort of happy medium must be attained in order to arrive at a balanced efficiency.

Forgetting for the moment all special branches except traffic law enforcement, I feel that there should definitely be specialists in traffic law enforcement in every police department, but that there is a reasonable minimum number of such now required and that the training of the entire law enforcement personnel of any police department in the handling of traffic law enforcement, coupled with the services of the above-mentioned experts, is the answer to today's problems in that respect.

I have seen numerous experiments tried,



such as requiring the district or beat car or cruiser, or whatever you may call it, to handle and report accidents involving property damage below certain sums and/or minor injuries. But that, in my opinion, fails because it leaves an "out" for the officer, who in 9 cases out of 10 will say to himself or his partner "This is over $30.00 or $50.00," whatever the amount may be, and/or "This individual is probably seriously injured, so we will call the crash car or accident investigation unit and let them do it."

I have also seen a combination of the above system, coupled with the assignment of a trained traffic man to each district station as safety officer for that district. I rather liked that system because under such a system the commanding officer of the district may be made responsible for safety activities within his district and it is quite easy to establish a competitive system for safety among the districts. Of course, if you have one central headquarters and no district stations that plan is out, although it can be converted to use even then.

I feel that training is the basic answer and that all law enforcement members of a police department should be trained in traffic law enforcement, just as they are trained in all other phases of law enforcement procedure. I believe that each and every man, whether he is a beat man or riding in a district car or assigned to the traffic division, should be required to have the necessary knowledge and skill to go to the scene of any traffic accident and make the necessary investigation and reports. He should also be sufficiently trained to be able to handle the various other phases of traffic law enforcement if and when the occasion might demand.

I also believe that there should be a comparatively small, compact, fully equipped and competently trained traffic law enforcement division in each police department which should be called upon to handle the overall program of traffic law enforcement and to investigate major accidents involving serious injuries, fatalities, hit and run cases, or property damage cases of such magnitude that they would warrant the attention of the specialists.

I believe that there should be a thoroughly trained and competent safety officer in each district, who should, under the general direction of the commanding officer of that district and with the aid of the traffic law enforcement division, train and educate the personnel of the district and oversee their activities as to safety in general, as well as in traffic particularly.

I quite definitely am convinced that the loss in time, man-power, general efficiency and public opinion engendered when over-specialization exists far outweighs any possible benefits that could be derived from such a condition. The officer on the beat or in the district car whose attention is called to an accident ignores the accident both because he has insufficent training and his department has a large specialized traffic division to whom he will undoubtedly refer the accident, since in his mind that is traffic law enforcement business and not his. It may be merely the simplest matter of temporary congestion at an intersection during a rush hour which the officer could straighten out in a matter of seconds but which he ignores, feeling that it is a traffic matter and not his business.

I don't believe any law enforcement officer would dare disagree with me when I point out how silly it would be for a policeman assigned to traffic work to refuse to take action on a holdup in his vicinity on the grounds that he was a traffic man and, therefore, the holdup was none of his business. If we expect the traffic man to be an all round policeman, we should certainly expect other officers to be the same.

To me the primary purpose of a police department or law enforcement body is the prevention of violations of all kinds. All members of the force are policemen and, therefore, should be interested in all phases of law enforcement. Quite frankly, I do not expect a member of the detective division to occupy his spare time issuing traffic summonses or parking tickets (if he has that much spare time maybe you have more detectives than you need), but I most certainly do feel that he should be capable and trained to the point that he could do so or investigate the scene of an accident if necessary.

Many of us are still having man-power troubles for various reasons and I am quite sure all of us are in the throes of traffic problems. I know of no better way to increase traffic law enforcement, and quite possibly education as well, than by requiring not only the traffic division but the entire force to show a reasonable amount of activity in traffic law enforcement.

Summing up, let me say that I do believe in specialization in traffic law enforcement and in many other phases of law enforcement work, but I do not believe it should be permitted to expand to the point where it over-balances the entire department. Rather, I believe that there should be an adequate number of highly trained, fully equipped, specialists who constitute the traffic enforcement divisions of police departments and who may be called upon to handle those cases of sufficient severity and magnitude to warrant their attention. For the general overall enforcement of traffic laws from day to day, week in and week out the year around enforcement program, I believe the entire department should be adequately trained to participate properly and efficiently and that only thereby will the police administrators be able to realize the full benefit of the man-power that may be available.



## Current Police Training Problems

**(A Panel Discussion)**

*Discussion Leader:* CAPTAIN W. L. GROTH, Safety Engineer, Virginia State Police, Richmond, Va.

*Participants:*

A. F. BRANDSTATTER, Head, Police Administration, Michigan State College, East Lansing, Mich.

CAPTAIN LLOYD W. HENKEL, Traffic Division, Police Department, Charlotte, N. C.

GERALD O'CONNELL, Director of Training, Northwestern University Traffic Institute, Evanston, Ill.

LIEUTENANT TED R. SMITH, Director of Training, Police Department, Pasadena, Calif.

CHAIRMAN GROTH: There is perhaps no other subject in policing that is so important as current police training problems, since departments are made or broken by the men which represent them. Equipping men to do the job is generally the task of the administrator; training is a means of equipping men with the "know-how" to do the job. If we in the law enforcement field are to continue in our efforts to put policing on a truly professional plane, we must give more attention to this all-important subject of training, which in many respects is the foundation upon which modern law enforcement techniques are built.

We will operate this panel by asking the panel members to comment on specific questions. Any other panel member may add his views or ask pertinent questions.

Let's start by asking Mr. O'Connell: What are the merits and disadvantages of the following training procedures?

1. Short courses, 1 to 2 weeks
2. Year round in-service training.

MR. GERALD O'CONNELL: In the matter of year-around service and training versus one or two-week training, I think this: The man who receives long-time training is a man who has indicated his ability to do the required job and who is sought after for upgrading. Therefore, that man is a key man in his outfit, and it is next to impossible to get him away for a year. Then, if you do get him away for a year and you did not have a well-defined, agreed-upon area for him to work in, what happens when he gets back? He is then too good for his activities. His opportunities within the department are too limited.

Well, that is one side of the story. I like to think of one or two weeks training not in terms of an attempt to tell all within a short period, but to use one- or two-week periods for unit training and in this way give continuity to a training program through a unit instruction which might be one full week, say, of 35 hours, or two weeks of 75 hours.

CHAIRMAN GROTH: Short courses have their place provided they are followed up by year-around, in-service training of some nature in order to keep raising the standard in the entire department.

CHAIRMAN GROTH: Let's ask Captain Henkel if he will give us his views as to what sources a police faculty should be drawn from. You gentlemen know that the Institute of Government at the University of North Carolina is now doing most of the training for the State of North Carolina. It is something new and a little bit different. We would be very much interested in your views, Captain Henkel.

CAPTAIN LLOYD W. HENKEL: I have seen schools run both from the outside and by trained police officers. I think it is more effective to get a trained police officer, a man of more mature age, to teach policemen. We have used this system to great advantage in our local schools.

Of course, we want specialized men for certain types of work, but just for general police training, we find that the experienced police officer has more influence than some of the others.

MR. O'CONNELL: The police, I think, have failed to take full advantage of the potentials of non-police instructors, and the error for that has been perhaps on two sides.

First of all, police officers think only another police officer can give them instruction. They are super-sensitive about someone coming in and telling them how to do their job. Some of these outside instructors have the attitude, "I am going to tell you how to do your job better."

However, I think the police by constantly drawing on their own groups for instructors are making a serious error. They are inbreeding themselves. Why shouldn't outside people, why shouldn't non-official, non-public people, have worth while things to contribute to us, and why shouldn't we seek after them for their help?

The problem is to get outside instructors into a training program in such a way that what they have to say is accepted.

In Evanston, we are running into that quite frequently in police officers attending our classes. They think, "That fellow can't know very much because he wasn't a police officer." I think it you ask several of them, they will tell you after a while, these non-police instructors can and do contribute very effectively to their increased understanding of what is involved in good police service.

LIEUTENANT TED R. SMITH: I agree up to this point, but I would like to make a qualification. I think instructors from outside the department are very essential and can be used to good advantage for certain academic courses, but I differ with Mr. O'Connell on his definition of training. I look on it as a means of getting your chief administrator's thinking down to the men in the field, and certainly your instructor is in no position to do that. I think the outside instructor can come in and give the basis of instruction, but it must be made to apply to your own department.

I can give you an example of what I mean from our own organization. We have an organization where we make use of the one-man patrol. We have a special black and white traffic investigation card with a man in there with the title of patrolman technician, a position which is foreign in many departments. Now, certainly, an instructor coming in and not knowing the organizational setup could not adapt his particular course to our training needs.

By coordinating that academic training to the application in the field and by having the director of training sit in the classroom, you can put in the pertinent points of the training where they will be adapted to local use. By going through the outlines before the instructor gets them, I think the thing Mr. O'Connell mentioned can be adapted to the sort of thing we get in our department.

MR. BRANDSTATTER: I am in general agreement with the use of outside instructors, but there is one thing you seem to forget. We have in the field of education today fellows who have years of police training.

I feel that we must recognize the fact that when a man begins in the police profession and then goes into the educational field, he shouldn't become stigmatized. I believe these instructors are familiar with the problems of the law enforcement functions. They are able to approach them intelligently and cope with them and provide the means by which the agency must work and better itself in the law enforcement program.

I noted that Lt. Smith said they make use of other agencies in his program. There are other agencies at Chapel Hill. More and more agencies are coming to universities and colleges to help prepare them for the classes that are taught.

CHAIRMAN GROTH: I don't think we should overlook the fact that in a majority of instances, those going to the universities and entering the police training field are men of police experience. Let's not overlook the fact that the universities and colleges in turn are looking to police to provide some of the backbone for the training courses they are providing.



We have attempted, over a period of years, to train police officers in various schools. Do you believe we as police organizations throughout the nation are generally cashing in on the personnel who have been sent to take this specialized training? Do you think that the majority of police departments are getting a return on this training?

LT. SMITH: I can speak freely from my own experiences, having sent representatives to Northwestern Traffic Institute and the National Academy. I feel there was a revolutionary change made in our traffic enforcement work due to our representative's being sent to the Northwestern Traffic Institute. We have two men, our chief detective and the assistant chief of police, who have attended the National Academy. I do not feel we have cashed in on that. I feel that the training was very beneficial to them as individuals, and the only reason it is not being used within our own department is that the Federal Bureau of Investigation on the West Coast has set up a [illegible]ng program wherein they will send instructors right to our departments. They have men who are proficient in instruction teach the subjects which we had been calling on these two men at the school to teach.

MR. O'CONNELL: The man who comes to the Institute comes as a representative of his department, and we are interested in seeing not only that he has the ability to learn and carry back, but also that there is some reasonable assurance that he will have the opportunity when he goes back to his department to put to use the information that he acquired while studying at the Institute.

I say, therefore, that the answer must be yes. In a large measure I think these men are cashing in on their training. I think it is good business for their departments to have a man trained because he comes back with useful information for large segments of the department.

CHAIRMAN GROTH: I think that very definitely brought out the point that an individual sent off for special training certainly owes it to his department to attempt through his own training programs to pass on the information he picks up. Do you agree?

LT. SMITH: I agree. I do think the Institute at Northwestern has done a swell job, and that the men from the traffic field who have attended come back and do a good job. However, I don't feel people who have attended the Academy have been utilized to the fullest extent. I would like to be corrected if anybody here thinks I am wrong, but I understand the purpose of sending men to the National Academy is to have them trained for teaching the department at the local level.

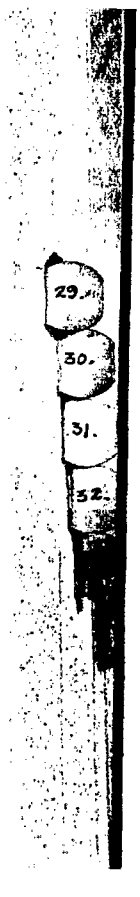
My personal experience has been that many of the men have been selected at random from the police department and sent to the Academy. They have received a swell job of training at the Academy, but they come back to the police department where a training program is not established. One of the reasons for this failure, in my observation, is that the police administrator or the head of the department does not believe in training. I believe the police administrator has to be sold on the philosophy of training; and, until that is done, I don't think we are going to gain the rewards and benefits of the training received by men who attend these schools.

MR. O'CONNELL: A trained man comes back to his department interested, willing and able. But it is important that there be an appreciation of his desire to do a job and an opportunity provided for him to put his ideas to work.

CHAIRMAN GROTH: I think we are agreed that if we are going to accomplish anything in the training field, we have to have support at the top level and the administrator level.

One of the things that we very definitely need in the training field is some uniformity of police training. Do you have any views as to how we might accomplish that?

LT. SMITH: In our vocational-educational program in California outlines are supplied to us by the state director of vocational training for police officers. These outlines give us a guide as to the type of training, the time to be spent on it and the



general procedure to follow on this type of work. We find these outlines useful in our particular case as they are a step in the direction of uniformity.

CHAIRMAN GROTH: Do you have any suggestions along that line?

MR. BRANDSTATTER: It seems to me we have cloaked training with a deep, dark secrecy and refused to unveil what is going on. There is a lack of exchange of information. We are making the same mistakes made 10 years ago.

If I go along with a training program and, through trial and error, find I am wrong, it seems to me that other police departments should profit from my experiences. Since all of us are engaged in the law enforcement work, we should benefit from each others' experiences.

I think we must enlist the cooperation of the police administrator, educators, and those working at training to define our local training problem.

Next, we must analyze the problem.

Then, we must agree on a training program to eliminate the problem. Finally, we should make the program available for publication so all of us will be familiar with the training ideas, techniques and procedures that are being evolved in the various sections of the country.

CHAIRMAN GROTH: I would like to ask Mr. Henkel if it is not true that one of the basic aims of the Institute of Government Training in North Carolina is to attempt to achieve uniformity in training and enforcement practices.

MR. HENKEL: It is very definitely true.

MR. O'CONNELL: I am not too clear on what is meant by standardization and uniformity with respect to training. However, I want to comment on the previous remarks regarding the secrecy that surrounds our police training. The materials of the Traffic Institute are useful only when they are employed by someone who can use them to advantage in his department for the improvement of his men. To that extent, all of the materials at the Institute are available. This material is of little use in our library.

Just one other comment with respect to uniformity of instruction. Are you referring to the Michigan plan or your form of enforcement? In Michigan, there is an interesting activity called a uniform enforcement program. It is a fine example of uniformity of instruction, and its values are legion.

CHAIRMAN GROTH: I would like to ask this question: Can small departments profitably offer their own training programs; and, if not, what type of training is best suited for such departments?

LT. SMITH: I have heard some people who have been in police training for many years say it cannot be done. I think it can be done. I realize some things depend on the department facilities, others on the attorney's office and some others on agencies that can augment your staff and people in the local government. It can be done through the cooperative effort of the people in public service, and through the use of the facilities available such as state agencies; federal agencies; and state universities, colleges and police training, such as the Institute at North Carolina and Michigan State College. They can help the smaller police department.

I have had some comment about that in Michigan. I had a letter from a chief who said that the police department just doesn't have the facilities to plan training. Not only that, but no one has offered to work with them on a training program.

I think the small police department, through the use of agencies set up in the community can do a good job. The prosecuting attorney could work within the province of the law. The state office can send somebody in. Certainly the universities and colleges can do a fine job.

In our case, we bank very heavily on the Los Angeles police department. They assist us in offering instruction in certain phases of police work. They have been helpful to us as we can call on these men in the field who are specialists in one particular subject.

One I have in mind is the crowd patrol. Certainly, in a small town, we wouldn't have occasion to assign a man to that type of work fulltime. Los Angeles does, and when we give a course in that, we call on the Los Angeles man. He has made a lifetime study of it. I could cite other examples. It certainly is good to know the larger cities will help you out in that respect.



CHAIRMAN GROTH: I am going to tell you of a program we have in operation in Virginia, which being a rural state has a rural problem.

We have in our state, operating under the Virginia Chief of Police Association, a Virginia police school. Instructors are selected from many departments throughout the state, and men from all departments attend. We hope to be able in the years ahead to expand the program somewhat and help to raise the standard of policing throughout the state.

The course is held in cooperation with the vocational section of our state department of education. Certainly, small departments need the assistance and are entitled to the help of those of us connected with larger organizations.

Police training, all too frequently carried on with little regard for improving the ability of the trainee to do his assigned job. Why does this error continue to exist in police work?

MR. O'CONNELL: I think part of the answer is that the police are just a supersensitive group of people. As soon as any criticism is voiced, the police immediately start scurrying around in an effort to build a dam or build a bulwark about themselves. The police are sensitive to criticism of their ability. We have had many uncomplimentary things said about us, and as a result, the police have scurried sometimes, without plan, to throw a cloak about themselves and to protect themselves. And, in this training, you will find all too frequently, the falsity in that cloak.

When you examine the training activity, you find men are spending many, many hours in instruction which contributes very little to the improvement of their assigned task. It is interesting stuff to know, but can training be justified on the basis of interesting information alone? For myself, I think not. We are competing for a tax dollar and when we are doing that, we have to look for the product that we produce. The only tangible product that we produce as a result of police training is evident ability in the man to do his job better. Therefore, a trainee must meet that standard. Anything less than that improvement in assigned tasks is not good enough.

We acknowledge that he must know about the policies of departments as departments. I can see all that. But if we are going to spend money, and if we expect to get more money, we must produce improved ability and increased efficiency on the part of the man.

LT. SMITH: Mr. O'Connell implies that the man in the field learns more about the job than his boss, and we all recognize that. That means the training has to start at the upper level. We realize the need for it. In any department we can see how impractical it would be to take the top administrator or the captain of the division and send them away. The department would be crippled.

MR. O'CONNELL: What we want is not men who can do things without thinking, but who, on the basis of their ability to think better, can work better.

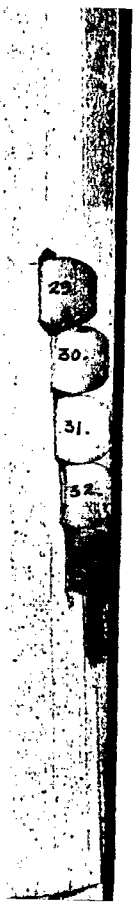
We talk broadly about the many kinds of activities that the police officer must perform. We talk about the complications of the job, the hazards of the job. If we are going to equip police officers with the actual know-how to do each one of the jobs, our training will never be finished. But, we can shorten the required training period by giving them some techniques and then training them to think independently and within the channels which the administrator sets up.

If we do that, then training will endure, but if we rely solely on activity, the men are going to get tired of just going through the motions without thinking.

CHAIRMAN GROTH: I would like to ask one more question before concluding this panel. I think it is an important one and I have saved it purposely to the last.

In so many activities, we have actual measurements or yardsticks, if you will, by which we can measure the results of a set program. I would like to ask if it is possible, in the opinion of any member of the panel, to develop measurements that could assist us in determining the effectiveness of instruction and training within our own organization?

MR. BRANDSTATTER: I don't think the field of education has itself arrived at a way of measuring the effectiveness of the structure. Attempts have been made through the use of examinations to determine what has been absorbed by the student as a result of an instruction period of training.



I don't think merely marking the student after he has received instruction is the answer. One student may have received a 100 and one 70. That isn't the answer. It doesn't show what the student has absorbed. Say you had two men equal in ability, but one with more academic background. The man with the background might get higher grades, but the other might be equally satisfactory out in the field.

There are intangibles which I think we, through the use of passing examinations to determine the effectiveness of instruction, have not tapped.

LT. SMITH: Certainly examinations are not the answer. Measuring the effectiveness of training by means of the results is the field comes closest to being an adequate method. However, there are many factors that must be taken into consideration. Say, for instance, you wanted to tell how effective the traffic enforcement program had been. We would measure that by citing the reduction in traffic accidents, but there are so many factors in that other than the ability of the policeman to make arrests in the field.

The best way I can judge how our men are performing is to talk with the field men in the I.C.C. and the National Safety Council and men who are on other police departments, who occasionally visit our department, and ask them how we are sizing up compared to other towns. I admit that that is a general way to do it, but as a rule of thumb, I would say it is as effective as any we can use in the absence of definite standards.

MR. HENKEL: I believe the only definite measurement is the public acceptance of your department after you have had the training program, particularly after the first trained officer comes out. The second thing is, the volume of the work the men do after having the training. Any administrator can measure and determine the effectiveness of the course by the type of work the men do after having had the course.

MR. BRANDSTATTER: I would like to comment if I may on the remark about comparing departments. I don't think it is fair to compare one department with another. I think there are too many things that enter into it, too many factors enter into the law enforcement of one community as compared with another. You can't compare the rural with the residential. There may be a few communities made up of relatively the same type of departments. But, there are factors such as ages, the amount of education that is available to the community, the recreation facilities, any number of things with respect to its make-up, and I think that possibly one of the best measuring sticks to be used with respect to the effectiveness of the department is to examine the record system. Determine whether or not crime is increasing or decreasing, or whatever the case may be. I think the records in the police department can do more to show how effective the department is, than possibly the comparison of one department with another.

## Judges and Prosecutors Conferences

**(A Summary of Remarks)**

By JUDGE EDWARD C. FISHER
Municipal Court, Lincoln, Neb.

Four Traffic Court Judges and Prosecutors Conferences have been held in the past 12 months at Northwestern University, the University of California at Berkeley, Tulane University and New York University. Each of these conferences was well attended and followed approximately the same pattern. Some highlights of the Northwestern and the Tulane conferences will serve to illustrate the approach of these conferences.

Sidney J. Williams opened the conference at Northwestern with a talk covering the whole field of traffic safety emphasizing the part played by the courts. He pieced together the points that had been made singly and gave them the proper perspective.

Franklin M. Kreml followed with an analysis of the theory of law enforcement. Beginning with rules laid down by family governments and rules of games, he developed the subject up to the enforcement of rules laid down for the protection of the public which we call "law."

J. Stannard Baker then considered the various engineering and psychological factors involved, emphasizing that the driver is the most important factor in the traffic control problem.

James Economos discussed the common tendency among lawyers to try traffic cases as though they were civil actions for damages. He then went on to note the things that can be done to meet and solve the various problems that we face.

Others gave detailed and technical discussions on such things as films, complaints, "reckless driving," accessories in traffic cases, etc. A wealth of material was passed out to be carried home for further study. There was a discussion on police work, its relationship with the court and the purposes to be accomplished. The constitutional issues frequently encountered in connection with self-incrimination were brought up. The question was raised whether a state could require the waiver of such rights as a prerequisite to the issuance of a driver's license.

The judges and prosecutors discussed the prosecutor's duties and functions, his attitude toward his job, as well as his responsibility to the community.

The conference at Tulane in April and May was addressed by New Orleans Judge Harold Moore who told about the political set-up in his city. Judge Harb then pointed out that without public support, a judge could accomplish very little. The only protection that a judge can have against the politicians is the support of the public. However, he added that since safety is good politics, he should try to sell city hall on it. But a judge must above all be in a position of security where he will not be subjected to the political pressure of the big shots. He is a bulwark of democracy; he must be absolutely independent. If he is a man of character and integrity, he will insist upon this independence above all else.



*Summary*—The conference sessions are not merely a means of exchanging ideas but they are also a definite attempt to give instruction in the right manner of doing the job. They are not held in the gay convention manner, but rather in an atmosphere conducive to intensive study.

Those present at the conferences were definitely there to learn. The best ideas were advanced and not in the atmosphere of debate but rather in that of an institution of learning. Anyone who attempted to extoll his own superior wisdom, was given a rough time.

By means of these conferences the judges were able to get a complete picture of the subject from recognized experts and authorities in the field. Substantial progress was made in just the fact that those present were made aware of the problem. After they realize what the problem is, then they can formulate something to do about it.

Insofar as these conferences follow a formalized curriculum, they approach the proportions of a training course for judges and prosecutors. With a whole week to devote to the subject, it is possible to cover far more ground in an authoritative way, than is possible at this National Safety Congress. At the Congress we have an important job to do in stimulating judges and prosecutors to seek this intensive training and also to inspire them to try to win public support for their courts in their home communities. We can act pretty much as a promotional agency lending all possible support to these various conferences as well as the local safety organizations.

I strongly recommend that every judge and every prosecutor attend at least one of these conferences. It will serve to coordinate all of his ideas and bring the whole picture into proper focus.

## Traffic Engineering Regulations, Devices and Design as Accident Reducers

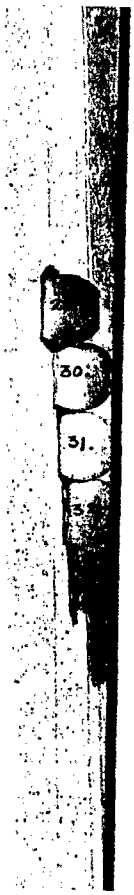
**(A Symposium)**

**Signals at Isolated Intersections**
THOS. E. WILLIS, Director, Department of Traffic & Transportation, City of Houston.

**One-Way Streets**
JAMES T. WHITE, Traffic Engineer, City of Fort Wayne.

**Parking Prohibitions**
C. L. SIMMONS, Traffic Engineer, Grand Rapids Police Department, Grand Rapids, Mich.

**Four-Way Stops**
HARRY H. HARRISON, Traffic Engineer, Illinois Division of Highways.



**Speed Zones**

J. E. P. DARRELL, Traffic Engineer, Minnesota Department of Highways.

**Highway Delineators**

J. CARL MCMONAGLE, Director, Planning and Traffic Division, Michigan State Highway Department.

### Signals at Isolated Intersections

MR. WILLIER: Traffic accidents and traffic congestion are produced at isolated intersections where motorists find it impossible to cross major streets safely and without undue delay. At such intersections, the possibility of safe and convenient crossings is a function of vehicle density and the speed of traffic. Headways between individual motor vehicles measured in time may not vary greatly with reduced traffic volumes because with reductions in volumes speeds increase. Motorists traveling on secondary streets, therefore, have few opportunities to cross major traffic arteries between moving motor vehicles.

Physical conditions at isolated intersections vary considerably. The efficient and safe flow of motor vehicle traffic at such intersections is dependent upon relative widths of roadways, the number of lanes in which traffic is flowing, parking conditions and truck and bus loading spaces near intersections, roadway surfaces, and visibility obstructions which may be evident.

Other factors which influence safe traffic movements are the relative volumes of traffic on major and secondary streets; the type of vehicle traffic which in many cases includes automobiles, busses and trucks; volume and times of pedestrian movements; speeds of vehicles; the nature of traffic patterns which produce peak flows during certain times of the day; turning movements and movements of motor vehicles into and out of parking spaces at the curb or off-street.

Traffic accidents occur at isolated intersections as a result of existing conditions, the nature of traffic movements, the condition of individual motor vehicles and the lack of caution on the part of motorists. Some of the more important causes of accidents at intersections are as follows:

1. Where traffic signals are not used to control the movements of motor vehicles at an isolated intersection, where motor vehicle volumes are high and where the major street is relatively wide, it is difficult for motorists and pedestrians to cross the major artery in safety without conflicting with motor vehicles approaching from either direction. This is due to the fact that motorists and pedestrians have difficulty in judging the time spacing of vehicles and, consequently, are unable to determine when it is safe to make the crossing.

2. Many motorists traveling on secondary streets at unsignalized intersections become impatient after waiting a reasonable length of time to cross a major street and then take unnecessary chances. Although the motorist himself may not be involved in an accident, he may be the indirect cause of accidents involving motor vehicles traveling on the major roadway. If sudden stops are required for motor vehicles traveling on a major artery owing to the crossing of traffic traveling on the secondary street, rear-end collisions often result.

3. Custom and habit directly influence accidents at isolated intersections. In many cities, motorists disregard the rights of other motorists attempting to cross major streets from secondary streets and will not yield the right of way. Traffic signal control automatically assigns the right of way alternately to the major traffic artery and to the secondary street thereby providing safe and frequent opportunities for crossing.

4. Some of the most severe types of accidents occur at intersections, and injuries and fatalities frequently result. If visibility is impaired, motorists traveling at high rates of speed on major streets often come in conflict with vehicles traveling on secondary streets and thereby cause serious accidents. Traffic signals will reduce and in most cases prevent such accidents.

In order to determine whether or not traffic signals are warranted at an isolated intersection, it is necessary to carefully evaluate all existing conditions as well as the nature of motor vehicle and pedestrian movements. Traffic surveys will reveal factual data which are essential in the analysis of conditions. Review of accident records and of the causes of individual accidents will assist traffic engineers in determining whether or not traffic signals should be installed.

There are several types of traffic signal installations which are adaptable to isolated intersections. The most common types are as follows:



1. Corner post traffic signals have been used extensively, with a single indication to approaching traffic. The present trend is to provide an additional signal face which will be visible to motorists on heavily traveled traffic arteries.

2. Center suspension or mast arm signals are adaptable to isolated intersections. Owing to the heavy flow of traffic on many major streets and to the use of several lanes for moving traffic, traffic engineers now recognize the advantage of giving advance warning of traffic signals by using center suspension or mast arm traffic signals. Such signals are visible to motorists at a greater distance than signals mounted at the curb on posts, and it is possible to provide indications to control the flow of traffic in individual lanes. Where right turns or left turns are permitted on multi-lane roadways, a traffic signal face may be mounted directly over each lane together with a sign indicating movements which are permitted. If any amount of pedestrian traffic is evident where center suspension or mast arm signals are to be used, then provision should be made for corner post pedestrian signal controls to supplement the motor vehicle signal indications.

Wherever fixed time traffic signals are located at isolated intersections, they may be coordinated with other nearby signalized intersections, within distances up to two thousand feet, by use of interconnecting cable or synchronous motor controllers to provide for progressive traffic flow.

Semi-actuated traffic signals may be installed at intersections where cross street traffic flow is not too heavy, and they will serve to minimize the delays for traffic on the major traffic artery. This type of control, however, would not reduce accidents at adjacent non-signalized intersections as would the fixed time signal controls. Arrangements should be made to program the operation of traffic signals at isolated intersections through use of two-dial or three-dial traffic controllers if there is any marked difference in the direction of traffic flow on the major street during the morning and afternoon peak hours.

Use of automatic traffic signals at isolated intersections will reduce traffic accidents but consideration must be given to the proper timing of such traffic signals and to the establishment of necessary traffic and parking regulations where these signals are installed. Motorists generally require several days to become acquainted with new traffic signal operations so police officers should be used for a short time to assist in directing traffic in order to prevent traffic accidents, particularly rear-end collisions. However, after motorists do become acquainted with traffic signals which are installed at isolated intersections, a reduction in all types of traffic accidents may be expected.

### One-Way Street Movement vs. Two-Way Street Movement

MR. WHITE: This report deals with a direct "before-after" comparison of traffic conditions pertaining to the one-way street system installed in Fort Wayne, Indiana, in September, 1947.

On the eighth of September, 1947, the first installation of Fort Wayne's one-way street system was the pair of streets composed of Wayne and Berry. Motorists and pedestrians have, with few exceptions, indorsed the one-way street system as logical, well planned and a remedial measure that should be expanded where possible to further relieve our over-all traffic problem.

It is well to point out that a one-way street system is but a partial solution of the over-all problem of relieving the central business district of its ever mounting traffic problem. A total over-all traffic program would include off-street and on-street parking improvements, pedestrian control and regulation, and a modern signal system. Hand in hand, such a program would improve traffic conditions between intersections as well as accommodating an increased intersection capacity.

A traffic survey of the central business district was conducted during July, 1946, and "after" studies of this report have been conducted during the same month this year. Such a comparison should remove any question of doubt dealing with the facts of this report. It is agreed that such direct comparisons can be shown without adjusting factors which are often required when unlike months and seasons of the year are involved.

The study showed that the total traffic *entering* 34 intersections has surmounted the 1946 total by *42,525* vehicles and further indicates an increase of 17.3 per cent.



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CHAIRMAN GROTH: Do you have any suggestions along that line?

MR. BRANDSTATTER: It seems to me we have cloaked training with a deep, dark secrecy and refused to unveil what is going on. There is a lack of exchange of information. We are making the same mistakes made 10 years ago.

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MR. O'CONNELL: I am not too clear on *what is meant by* standardization and uniformity with respect to training. However, I want to comment on the previous remarks regarding *the* secrecy *that* surrounds our police training. The materials of the Traffic Institute are useful only when they are employed by someone who can use them to advantage in his department for the improvement of his men. To that extent, all of the materials at the Institute are available. This material is of little use in our library.

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MR. BRANDSTATTER: I don't think the field of education has itself arrived at a way of measuring the effectiveness of the structure. Attempts have been made through the use of examinations to determine what has been absorbed by the student as a result of an instruction period of training.

**CORRECTION**

**The preceding document has been rephotographed to assure legibility and its image appears immediately hereafter.**

I don't think merely marking the student after he has received instruction is the answer. One student may have received a 100 and one 70. That isn't the answer. It doesn't show what the student has absorbed. Say you had two men equal in ability, but one with more academic background. The man with the background might get higher grades, but the other might be equally satisfactory out in the field.

There are intangibles which I think we, through the use of passing examinations to determine the effectiveness of instruction, have not tapped.

LT. SMITH: Certainly examinations are not the answer. Measuring the effectiveness of training by means of the results in the field comes closest to being an adequate method. However, there are many factors that must be taken into consideration. Say, for instance, you wanted to tell how effective the traffic enforcement program had been. We would measure that by citing the reduction in traffic accidents, but there are so many factors in that other than the ability of the policeman to make arrests in the field.

The best way I can judge how our men are performing is to talk with the field men in the I.C.C. and the National Safety Council and men who are on other police departments, who occasionally visit our department, and ask them how we are sizing up compared to other towns. I admit that that is a general way to do it, but as a rule of thumb, I would say it is as effective as any we can use in the absence of definite standards.

MR. HENKEL: I believe the only definite measurement is the public acceptance of your department after you have had the training program, particularly after the first trained officer comes out. The second thing is, the volume of the work the men do after having the training. Any administrator can measure and determine the effectiveness of the course by the type of work the men do after having had the course.

MR. BRANDSTATTER: I would like to comment if I may on the remark about comparing departments. I don't think it is fair to compare one department with another. I think there are too many things that enter into it, too many factors enter into the law enforcement of one community as compared with another. You can't compare the rural with the residential. There may be a few communities made up of relatively the same type of departments. But, there are factors such as ages, the amount of education that is available to the community, the recreation facilities, any number of things with respect to its make-up, and I think that possibly one of the best measuring sticks to be used with respect to the effectiveness of the department is to examine the record system. Determine whether or not crime is increasing or decreasing, or whatever the case may be. I think the records in the police department can do more to show how effective the department is, than possibly the comparison of one department with another.

## Judges and Prosecutors Conferences

**(A Summary of Remarks)**

By JUDGE EDWARD C. FISHER
Municipal Court, Lincoln, Neb.

Four Traffic Court Judges and Prosecutors Conferences have been held in the past 12 months at Northwestern University, the University of California at Berkeley, Tulane University and New York University. Each of these conferences was well attended and followed approximately the same pattern. Some highlights of the Northwestern and the Tulane conferences will serve to illustrate the approach of these conferences.

Sidney J. Williams opened the conference at Northwestern with a talk covering the whole field of traffic safety emphasizing the part played by the courts. He pieced together the points that had been made singly and gave them the proper perspective.

Franklin M. Kreml followed with an analysis of the theory of law enforcement. Beginning with rules laid down by family governments and rules of games, he developed the subject up to the enforcement of rules laid down for the protection of the public which we call "law."

J. Stannard Baker then considered the various engineering and psychological factors involved, emphasizing that the driver is the most important factor in the traffic control problem.

James Economos discussed the common tendency among lawyers to try traffic cases as though they were civil actions for damages. He then went on to note the things that can be done to meet and solve the various problems that we face.

Others gave detailed and technical discussions on such things as films, complaints, "reckless driving," accessories in traffic cases, etc. A wealth of material was passed out to be carried home for further study. There was a discussion on police work, its relationship with the court and the purposes to be accomplished. The constitutional issues frequently encountered in connection with *self-incrimination* were brought up. The question was raised whether a state could require the waiver of such rights as a prerequisite to the issuance of a driver's license.

The judges and prosecutors discussed the prosecutor's duties and functions, his attitude toward his job, as well as his responsibility to the community.

The conference at Tulane in April and May was addressed by New Orleans Judge Harold Moore who told about the political set-up in his city. Judge Harb then pointed out that without public support, a judge could accomplish very little. The only protection that a judge can have against the politicians is the support of the public. However, he added that since safety *is* good politics, he should try to sell city hall on it. But a judge must above all be in a position of security where he will not be subjected to the political pressure of the big shots. He is a bulwark of democracy; he must be absolutely independent. If he is a man of character and integrity, he will insist upon this independence above all else.



*Summary*—The conference sessions are not merely a means of exchanging ideas but they are also a definite attempt to give instruction in the right manner of doing the job. They are not held in the gay convention manner, but rather in an atmosphere conducive to intensive study.

Those present at the conferences were definitely there to learn. The best ideas were advanced and not in the atmosphere of debate but rather in that of an institution of learning. Anyone who attempted to extoll his own superior wisdom, was given a rough time.

By means of these conferences the judges were able to get a complete picture of the subject from recognized experts and authorities in the field. Substantial progress was made in just the fact that those present were made aware of the problem. After they realize what the problem is, then they can formulate something to do about it.

Insofar as these conferences follow a formalized curriculum, they approach the proportions of a training course for judges and prosecutors. With a whole week to devote to the subject, it is possible to cover far more ground in an authoritative way, than is possible at this National Safety Congress. At the Congress we have an important job to do in stimulating judges and prosecutors to seek this intensive training and also to inspire them to try to win public support for their courts in their home communities. We can act pretty much as a promotional agency lending all possible support to these various conferences as well as the local safety organizations.

I strongly recommend that every judge and every prosecutor attend at least one of these conferences. It will serve to coordinate all of his ideas and bring the whole picture into proper focus.

## Traffic Engineering Regulations, Devices and Design as Accident Reducers

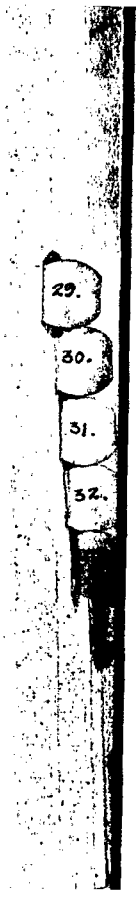
**(A Symposium)**

**Signals at Isolated Intersections**
THOS. E. WILLIER, Director, Department of Traffic & Transportation, City of Houston.

**One-Way Streets**
JAMES T. WHITE, Traffic Engineer, City of Fort Wayne.

**Parking Prohibitions**
C. L. SIMMONS, Traffic Engineer, Grand Rapids Police Department, Grand Rapids, Mich.

**Four-Way Stops**
HARRY H. HARRISON, Traffic Engineer, Illinois Division of Highways.



**Speed Zones**
J. E. P. DARRELL, Traffic Engineer, Minnesota Department of Highways.

**Highway Delineators**
J. CARL MCMONAGLE, Director, Planning and Traffic Division, Michigan State Highway Department.

### Signals at Isolated Intersections

MR. WILLIER: Traffic accidents and traffic congestion are produced at isolated intersections where motorists find it impossible to cross major streets safely and without undue delay. At such intersections, the possibility of safe and convenient crossings is a function of vehicle density and the speed of traffic. Headways between individual motor vehicles measured in time may not vary greatly with reduced traffic volumes because with reductions in volumes speeds increase. Motorists traveling on secondary streets, therefore, have few opportunities to cross major traffic arteries between moving motor vehicles.

Physical conditions at isolated intersections vary considerably. The efficient and safe flow of motor vehicle traffic at such intersections is dependent upon relative widths of roadways, the number of lanes in which traffic is flowing, parking conditions and truck and bus loading spaces near intersections, roadway surfaces, and visibility obstructions which may be evident.

Other factors which influence safe traffic movements are the relative volumes of traffic on major and secondary streets; the type of vehicle traffic which in many cases includes automobiles, busses and trucks; volume and times of pedestrian movements; speeds of vehicles; the nature of traffic patterns which produce peak flows during certain times of the day; turning movements and movements of motor vehicles into and out of parking spaces at the curb or off-street.

Traffic accidents occur at isolated intersections as a result of existing conditions, the nature of traffic movements, the condition of individual motor vehicles and the lack of caution on the part of motorists. Some of the more important causes of accidents at intersections are as follows:

1. Where traffic signals are not used to control the movements of motor vehicles at an isolated intersection, where motor vehicle volumes are high and where the major street is relatively wide, it is difficult for motorists and pedestrians to cross the major artery in safety without conflicting with motor vehicles approaching from either direction. This is due to the fact that motorists and pedestrians have difficulty in judging the time spacing of vehicles and, consequently, are unable to determine when it is safe to make the crossing.

2. Many motorists traveling on secondary streets at unsignalized intersections become impatient after waiting a reasonable length of time to cross a major street and then take unnecessary chances. Although the motorist himself may not be involved in an accident, he may be the indirect cause of accidents involving motor vehicles traveling on the major roadway. If sudden stops are required for motor vehicles traveling on a major artery owing to the crossing of traffic traveling on the secondary street, rear-end collisions often result.

3. Custom and habit directly influence accidents at isolated intersections. In many cities, motorists disregard the rights of other motorists attempting to cross major streets from secondary streets and will not yield the right of way. Traffic signal control automatically assigns the right of way alternately to the major traffic artery and to the secondary street thereby providing safe and frequent opportunities for crossing.

4. Some of the most severe types of accidents occur at intersections, and injuries and fatalities frequently result. If visibility is impaired, motorists traveling at high rates of speed on major streets often come in conflict with vehicles traveling on secondary streets and thereby cause serious accidents. Traffic signals will reduce and in most cases prevent such accidents.

In order to determine whether or not traffic signals are warranted at an isolated intersection, it is necessary to carefully evaluate all existing conditions as well as the nature of motor vehicle and pedestrian movements. Traffic surveys will reveal factual data which are essential in the analysis of conditions. Review of accident records and of the causes of individual accidents will assist traffic engineers in determining whether or not traffic signals should be installed.

There are several types of traffic signal installations which are adaptable to isolated intersections. The most common types are as follows:



1. Corner post traffic signals have been used extensively, with a single indication to approaching traffic. The present trend is to provide an additional signal face which will be visible to motorists on heavily traveled traffic arteries.

2. Center suspension or mast arm signals are adaptable to isolated intersections. Owing to the heavy flow of traffic on many major streets and to the use of several lanes for moving traffic, traffic engineers now recognize the advantage of giving advance warning of traffic signals by using center suspension or mast arm traffic signals. Such signals are visible to motorists at a greater distance than signals mounted at the curb on posts, and it is possible to provide indications to control the flow of traffic in individual lanes. Where right turns or left turns are permitted on multi-lane roadways, a traffic signal face may be mounted directly over each lane together with a sign indicating movements which are permitted. If any amount of pedestrian traffic is evident where center suspension or mast arm signals are to be used, then provision should be made for corner post pedestrian signal controls to supplement the motor vehicle signal indications.

Wherever fixed time traffic signals are located at isolated intersections, they may be coordinated with other nearby signalized intersections, within distances up to two thousand feet, by use of interconnecting cable or synchronous motor controllers to provide for progressive traffic flow.

Semi-actuated traffic signals may be installed at intersections where cross street traffic flow is not too heavy, and they will serve to minimize the delays for traffic on the major traffic artery. This type of control, however, would not reduce accidents at adjacent non-signalized intersections as would the fixed time signal controls. Arrangements should be made to program the operation of traffic signals at isolated intersections through use of two-dial or three-dial traffic controllers if there is any marked difference in the direction of traffic flow on the major street during the morning and afternoon peak hours.

Use of automatic traffic signals at isolated intersections will reduce traffic accidents but consideration must be given to the proper timing of such traffic signals and to the establishment of necessary traffic and parking regulations where these signals are installed. Motorists generally require several days to become acquainted with new traffic signal operations so police officers should be used for a short time to assist in directing traffic in order to prevent traffic accidents, particularly rear-end collisions. However, after motorists do become acquainted with traffic signals which are installed at isolated intersections, a reduction in all types of traffic accidents may be expected.

### One-Way Street Movement vs. Two-Way Street Movement

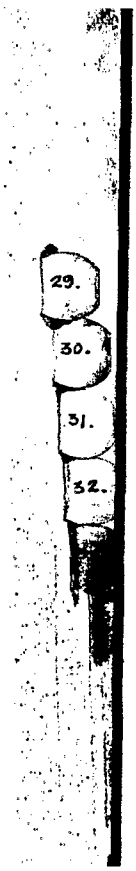
MR. WHITE: This report deals with a direct "before-after" comparison of traffic conditions pertaining to the one-way street system installed in Fort Wayne, Indiana, in September, 1947.

On the eighth of September, 1947, the first installation of Fort Wayne's one-way street system was the pair of streets composed of Wayne and Berry. Motorists and pedestrians have, with few exceptions, indorsed the one-way street system as logical, well planned and a remedial measure that should be expanded where possible to further relieve our over-all traffic problem.

It is well to point out that a one-way street system is but a partial solution of the over-all problem of relieving the central business district of its ever mounting traffic problem. A total over-all traffic program would include off-street and on-street parking improvements, pedestrian control and regulation, and a modern signal system. Hand in hand, such a program would improve traffic conditions between intersections as well as accommodating an increased intersection capacity.

A traffic survey of the central business district was conducted during July, 1946, and "after" studies of this report have been conducted during the same month this year. Such a comparison should remove any question of doubt dealing with the facts of this report. It is agreed that such direct comparisons can be shown without adjusting factors which are often required when unlike months and seasons of the year are involved.

The study showed that the total traffic entering 34 intersections has surmounted the 1946 total by 42,525 vehicles and further indicates an increase of 17.3 per cent.



With two exceptions, individual intersections also showed a traffic increase. The decreases in traffic volumes resulted from rerouting.

Examination of results reveals that one intersection has had an increase of traffic in the amount of 54.8 per cent above 1946. Another intersection had an increase of 41 per cent. It is common to observe traffic increases ranging within the percentage limits of plus 20 to plus 30.

Speed-delay studies were conducted during peak traffic hours in each lane of certain thoroughfares. This study did reveal that it is advantageous to drive in the left lane of a one-way street as over-all speeds were found in some instances to be almost 25 per cent higher in this lane over that of the right lane.

It was brought out in the recent traffic survey of the central business district that speeds were prevailing on these streets within this area as low as 7 M.P.H. The "Before" study indicates that over-all speeds reached a high of 9 M.P.H. on one street, and a low of 6.9 M.P.H. on another street, while two other streets remained within close range of each other at speeds of 8.9 M.P.H., and 8.1 M.P.H.

The "After" study comparison indicates that a former over-all high speed of 9 M.P.H. as prevailing on one street has been increased 58.3 per cent while low speeds as found on another street have been increased 77.5 per cent.

Field observance studies at signalized intersections where two-way traffic is in operation and during a "green" period will move from *10 to 12 cars* through the intersection, while the *same* "green" period at a one-way street approach to the intersection will clear from *15 to 20* vehicles.

The report thus has indicated that over-all speeds upon one-way streets have been increased as much as 76.6 per cent above two-way operation, and delay periods have been reduced as much as 86 per cent. The efficiency of the intersection has also shown an improvement and a comparison of the two systems of street operations show an increase in traffic volume upon one-way streets. These factors can be pointed to as one of the major accomplishments that has been achieved by the use of one-way streets in the relief of congestion and expediting the flow of traffic.

The preceding paragraphs of this report have dealt basically with the traffic improvements which have been found to exist concerning increased traffic flow upon the streets of the one-way street system and through the intersections of the same; and, also, the improvements that have been made in over-all speeds upon the one-way streets versus two-way streets, mindful of the fact that improvements in over-all speeds will in turn indicate a reduction in congestion upon the one-way street system.

The final paragraphs of this report will deal with a 10-month study period concerning the "before" and "after" accident trend upon one-way streets versus two-way streets. While it is not entirely encouraging to point to a greater reduction in accidents than this report can show at this time, nevertheless accidents as a whole have decreased approximately 10 per cent when considering the combination of intersection and mid-block locations as a unit.

Weather conditions have also had a considerable bearing on this phase of the study and indicate that greater reduction in accidents can be anticipated inasmuch as dry pavement accidents have been reduced as much as 17.6 per cent below the accident experience recorded and charged against two-way operation. The one-way street installations were placed in operation during the early fall months of 1947. Due to circumstances beyond the control of this department, the "after" study has involved a period of time when there was a change of administration. Also, weather conditions being comparable during the winter months and due to change of personnel in those departments responsible for ice control and removal, it would be found that these departments were not operating to a degree of efficiency that might be expected of a department having had a longer period to prepare itself for a program of this nature. Consequently, the study showed that accidents have increased 86.1 per cent upon the one-way streets during snow and ice conditions.

The encouraging results can be more deeply appreciated when we consider that in spite of the fact that we have had an increase of the percentage mentioned above upon the one-way streets during the snow and ice period of the study that the over-all period of 10 months before and 10 months after has as a unit shown a notable percentage reduction. It is logical to point out that with improvement of the snow and ice control program, greater accident reductions may be hoped for in the coming months over and above the figures charged against the city during the past winter months of this year.



### Parking Prohibitions

MR. SIMMONS: Perhaps no part of the traffic problem causes greater concern than the parking problem. We find direct conflict between those who desire to use the streets for movement alone, and those who desire to park.

In designing the parking regulations as accident reducers we might divide our thoughts to midblock prohibitions and intersectional parking prohibitions.

Thinking for a moment about the midblock prohibitions I think we should concern ourselves first with a place reserved for conducting business, a loading zone. Will we have one loading zone for the entire block or will we have a number of zones located at strategical points regardless of the number in the block? Will they all be of uniform size regardless of their location? Will the loading zones be marked out on the curbs by distinguishing color augmented by signs of a uniform height? Will angle parking be permitted by trucks actually in the process of loading or unloading? Will the zone be used all during the day or will trucking be forced to certain hours in the morning and perhaps certain hours in the afternoon?

The answers to these questions will determine to a considerable extent the accident experience in the mid block.

I think most of us will agree that one loading zone for an entire block will not answer our problem. The trucker, even more than the parker, wants to deliver his goods to the front door of the small business place. They will double park to deliver three or four parcels of express or merchandise, rather than park in a loading zone two stores away or get involved in an alley which is all too frequently so narrow that it is blocked two thirds of the time. We will have to place those zones which are necessary after a complete investigation has been made as to the accessibility of off street loading facilities.

It is evident too that they can not all be of uniform size. You will want to conserve on space within a certain business square in the center of town and force truckers to make those necessary deliveries in small trucks. As you get farther from the central business district you may want to allow larger trucks to make pick ups and deliveries on the streets.

The zones must be well marked with uniform signs or the enforcement end will encounter difficulties keeping the zones clear for that which it was intended. We have found that changes in the types of business in a certain locality necessitate the changing or the removal of a zone. If curbs are painted in the loading zones it would mean confusion, and inattention on the part of the parker in two or three years, because of the number of vacated zones.

We have found an increase of about 23 per cent in "side swipe" and "turning to interfere" accidents in those places where angle parking of any kind is allowed. How then are we going to allow trucks to unload? The answer is of course "side door" deliveries, loading as well as unloading from the side of the truck.

The question as to the duration of the time goods may be delivered is important to both the shipper and to the common carrier, but it is also an important one to the enforcement agencies in the reduction of congestion and accidents during peak hours. Trucking concerns like to make up their semi-loads by going from one concern to another loading their goods in the inverse order in which they are to be delivered on the road.

In a recent survey in Grand Rapids to determine the feasibility of regulating the hours of pick-up and deliveries, size of trucks, etc., the trucking industry indicated they would have to place an embargo on all goods bound for Grand Rapids if this were put into effect. You can see what happened to that little project when some of the merchants found out about it!

Still in our midblock design of parking prohibitions to reduce accidents let us turn our attention to the place which is to accommodate the vehicle at the curb. The curb itself must be low enough so that it will not damage the new type cars. Signs and posts must be kept at least 18" in from the curb. Adequate length of zone must be



clearly marked along the length of the curb. Parking meters installed in Grand Rapids reduced the parking accidents some twenty per cent.

Meters may be installed to accommodate the very short time parker and the long time parker. It is well to have short time meters at strategic spots in the central business district. This will tend to reduce the double parking caused by people who "just want to go in here for a minute." These meters must be of a distinguishing color—(unless variable time meters are in use) different from the rest so they can be spotted by a motorist who is trying to find a longer time parking place. We have found it necessary to have meters in four colors; the 12-minute meter is orange, the special meter "no parking after 4:30" in red, the two-hour meter in green, and the regular one-hour meter in grey.

The parking meter then is a definite help in the reduction of accidents in those places where there must be parking.

A design for parking vehicles in the midblock has been tried in a suburban section of Grand Rapids which has reduced the accident rate to zero by making use of the distance between the curb line and the store front. At the curb line a safety island was constructed and the vehicles were forced to park parallel in a roadway parallel to the main thoroughfare. The merchants, of course, were against it at first but when they found an equal number of parking places in front of their stores most of them went along with the engineering section.

Let us think for a moment about the intersectional prohibitions. How are we going to govern our bus stops? Will they be near side, far side, midblock? How long will they be? How will they be marked off and signed? These are all questions that must be answered and I am sure must be answered by saying once more that "It depends upon the situation." In some cases the accident frequency will be higher for the near side stop than for the far side; in others the reverse will be true.

We will have to remember certain factors when we talk about a near side stop for a bus. First in the minds of operators is the time factor. They will have the light against them fifty per cent of the time and will have to stop regardless of whether there is a pick-up or not. If there is a far side stop the vehicle will have to stop once again to pick up a passenger on the other side of the street. Cost of operation, and time then, are in favor of the near side stop for the bus company. On the other hand in a place where there are a great number of right turns by passenger vehicles you will increase the accident rate because of vehicles trying to make right turns in front of the bus. In those places where the right turns are at a minimum the accident rate in Grand Rapids has shown that the 40 or 50 feet of the intersection itself is a help in getting the bus back into the stream of traffic.

In designing the bus zones we must remember that the buses too are getting longer. This summer a survey was made along one of the main trunk lines and it was found that the average stop was 31.2 feet. This in places where there were as many as three different bus lines all with buses thirty-two feet long, needless to say resulted in congestion on the highway causing accidents. The bus zones have now been lengthened to a minimum of 65 feet and in some cases are as long as a hundred and twenty feet to accommodate the mass transportation.

The far side stop is an accident hazard as far as Grand Rapids is concerned because of the right turning movement at those points. Vehicles wishing to make a right turn frequently did so just as the bus was turning out into the lane of traffic and accidents resulted.

We can not afford the midblock stop in most cases because of the length of the stop necessary. The elimination of parking to such an extent as to allow a safe turn into the curb and a safe exit from the zone is, in most instances, prohibitive. We have used the midblock stop in those places where the parking had been eliminated for the entire block, and it was safer to discharge and take on passengers midblock than at either end of that block.

It was found in the survey of the bus stops that it was hard to determine exactly where the stop was. Inadequate marking of the bus zone frequently led to violations by parkers in the area set aside for the zone. When the new zones were installed they were not only marked by posts at each end indicating a bus zone but were also marked off with bands of white paint a foot wide forming a frame for the stop zones inside of which were painted the words "Bus Stop" in four foot letters. There is no question now about parking in a bus stop.

It seems the answer to the parking situation as far as the traffic engineer is concerned lies with those who are carrying on business. If the streets were used for the purpose for which they were built, accidents would be materially reduced and traffic would move faster. To traffic people the solution is rapidly becoming the elimination of parking completely in those places and at those peak periods when congestion and delay cause the accident rate to soar. This may be done tactfully by selecting certain key positions or points and later on, say four or five months later, connect the points up. This will mean an overall plan of action which will cover a period of time but which will mean safety for your people when it is completed.

These points then are important in parking prohibitions: 1. Adequate loading zones, properly placed for parallel parking while in the process of loading or unloading merchandise; 2. Adequate length of stalls for vehicles where parking is necessary, with adequate short time parking properly marked by meter colors; 3. The proper placement of the bus stops of adequate length and properly marked; 4. The elimination of parking entirely in those points and along those routes where congestion and delay occur.



### Four-Way Stop Control

MR. HARRISON: Four-way stop control at highway intersections is a subject in which everyone has a direct interest. It is timely to include it in this program because of the growing demand for its use and because of the importance of limiting its use to the purposes intended.

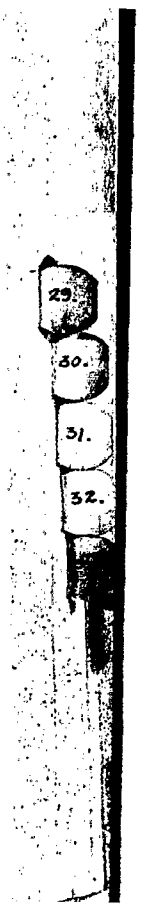
The application principles consist of two phases, first, the value of such control as a regulatory measure where volume of traffic is the primary factor and approach speed is secondary, and second, as a means of reducing angular type accidents where approach speed is the primary factor and volume of traffic is secondary.

In the first phase, its use for such purpose is bordering on the field of traffic signal control. While in this case it may be considered an intermediate step in intersection control between the common two-way stop and the traffic signal, its operation is quite different than either. Under two-way control, the major artery always has the right of way and motorists on the secondary thoroughfare must select safe gaps based on individual judgment in which to cross. Under signal control only two directions of traffic may enter the intersection simultaneously with right of way positively defined. Under this control the need for safe judgment by all 'individuals' is reduced to a minimum.

Under four-way control we find a totally different condition in actual practice. We consider that the right of way rule is the same as though no stop control existed. Act V, Section 82, of the Uniform Code provides that the driver of a vehicle approaching an intersection shall yield the right of way to a vehicle which has entered the intersection from a different highway; also, when two vehicles enter an intersection from different highways at approximately the same time, the driver of the vehicle on the left shall yield the right of way to the vehicle on the right. Other rules in Sections 83 and 84 further define left turn right of way and obedience to stop signs. Thus entry from all four directions can be made simultaneously, and at heavily traveled intersections this is common practice.

While it is admitted that vehicle actuated signal control of appropriate type is the most effective and perhaps efficient means of positively defining right of way at grade intersections, the cost of installing such control at all points where definition of right of way may be warranted is prohibitive. Observations have shown that large volumes of vehicular traffic can be handled with safety and reasonable efficiency under four-way stop control. Of course, the greatest advantage is to drivers and the least advantage is to pedestrians. This is because of the tendency of drivers on all approaches to complete their intended movement with the least delay possible, resulting in a maze of movements usually bewildering to the pedestrian. Consequently, if pedestrian crossings represent an important factor, together with high vehicular volumes, signal control should be provided as soon as practicable.

In the second phase, we have the problem



of preventing or reducing accidents at rural intersections where approach speeds plus appreciable volume of traffic on the major artery cause frequent misjudgment of safe gaps by drivers entering on the secondary highway, resulting in angular type accidents.

In Illinois, as is the case in most states, U. S. and state numbered trunk line highways are generally given preference through all intersections by stop sign control on the secondary approaches. Such control is effective unless the speed or volume of traffic on the trunk highway requires precise or unusually accurate judgment to enter or cross the highway safely. In this case, there is some ground for controversy. Some traffic authorities may contend that with proper obedience to two-way stop control and with adequate enforcement there is no need to inflict a stop penalty upon the major artery. I think we will all agree with such argument if four-way stop control is applied indiscriminately and if it is used solely to overcome two-way violations in the absence of adequate enforcement.

The most common problem in this field to the state highway traffic engineer is the intersection of two state or U. S. numbered highways. Here he is faced with many complicating psychological factors in addition to material warrants. Some of these are:

(a) High percentage of foreign motorists who are strangers to the location.

(b) The false feeling of security of long distance travelers that they enjoy the right of way and full protection through all intersections.

(c) The tendency toward higher speeds and the reluctance of motorists to reduce speeds through intersections or to otherwise recognize the right or safety of cross traffic.

(d) The higher tendency to "chisel" on stop control in rural areas.

It is obvious, therefore, from the discussion of these two phases that a series of warrants and values are necessary as a guide to the application of this type of control to obtain consistency and reasonable uniformity, and that each individual case must be considered on its merits. Those who are engaged in the traffic control field are aware of the dire consequences of precedent. Haphazard use of this type control without regard to its justifying elements will eventually make it such a nuisance that its value as an intermediate control will be materially weakened.

Observations of the behavior of motorists and their response to four-way stop control has shown some uncertainty as to their right of way privileges and even lack of recognition of the four-way stop control being in effect. About two years ago we experimented with a method of acquainting drivers with the control they were entering by adding the supplementary message "4-WAY" in the upper panel above the word "STOP" on each approach to one intersection in each of our ten districts. Frequent observations were made by our traffic engineers and officers of the State Highway Police to determine the resulting effect. The results were so favorable that the use of this message was gradually expanded throughout the State until now it has been adopted as standard. We were concerned, of course, that such information might cause an increase in the number of rolling or gear shift stops, thus reducing the value of the control. Enforcement policy as stated by the Superintendent of the Illinois State Highway Police has always been and must of necessity be that drivers shall bring their vehicles to a complete stop. It is admitted, however, that under four-way stop control some tolerance may be allowed if a safe condition exists, dependent solely upon the judgment of the officer observing the movement.

Recently a brief survey of public opinion as to four-way stop control was conducted at widely scattered locations throughout Illinois. The answers obtained to the following questions are of general interest.

(1) Do you favor four-way stop control?

| | *Foreign motorists* | *Illinois motorists* | *Total* |
|---|---|---|---|
| Yes | 90% | 94% | 93% |
| No | 10% | 6% | 7% |

(2) Do you make complete stop?

| | | | |
|---|---|---|---|
| Yes | 80% | 63% | 73% |
| Rolling Stop | 20% | 37% | 27% |

(3) Is four-way stop control confusing?

| | | | |
|---|---|---|---|
| Yes | 37% | 20% | 31% |
| No | 63% | 80% | 69% |

(4) Is the "4-WAY" message on the stop sign of value in eliminating confusion?



| | | | |
|---|---|---|---|
| Yes | 93% | 89% | 91% |
| No | 7% | 11% | 9% |

Some of those voting "No" did not have a definite opinion; others thought this message should also be displayed in advance of the intersection.

Exact figures for our total experience in accident reduction at rural intersections were not available for this discussion. It is believed, however, that the record at two important intersections on the Illinois highway system will indicate the accident reduction potential.

*Illinois 88 and 92 (27 miles south of Sterling)*

*Two-Way Control*

1939—2 accidents resulting in 6 injuries and 2 fatalities.

*Four-Way Control*

1940 to date—3 accidents, two of which were rear end collisions, resulted in 2 injuries. The other was a noncollision property damage accident.

*U. S. 51 and Illinois 64 (6 miles north of Rochelle)*

*Two-Way Control*

1938-42—14 accidents resulting in 3 fatalities and 40 injuries.

*Four-Way Control*

1942 to date—4 accidents, two of which were rear end collisions, 3 injuries, 0 fatalities.

Each district office offered the general comment that accidents have been greatly reduced both in number and severity following the change from two-way to four-way stop control.

We are convinced that four-way stop control has a rightful place as an intermediate means of regulating traffic at high volume intersections in urban areas and as an instrument of accident prevention in areas where high speed is prevalent.

The following is offered as suggested elementary criteria for the installation of such control.

1. Traffic Volume.
   Urban—400 to 750 per hour for 6 hours with ratio of 60 per cent-40 per cent.
   Rural—300 to 750 per hour for 6 hours with ratio of 65 per cent-35 per cent.
2. Accident Record under two-way control.
   Urban—5 right angle accidents per year resulting in property damage of $50 or greater or 3 personal injury accidents.
   Rural—4 right angle accidents per year resulting in property damage of $50 or greater or 2 personal injury accidents.
3. Other factors such as restricted sight distance, approach gradients, width of intersecting highways, and the prevailing speeds on the preferential highway must also be considered.

This discussion is not intended to create the impression that we believe the four-way stop control is a cure-all for the intersection problem. Rather it is offered in support of the judicious application of it as an intermediate method of control.

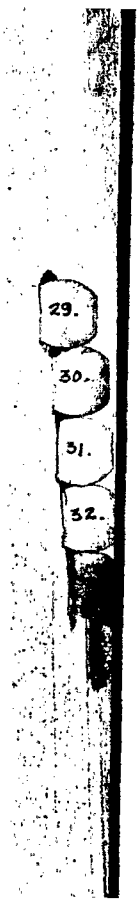
### Speed Zones

MR. DARRELL: Speed control continues to be the most common cause of all traffic complaints received by a traffic engineering office. I suppose the reason for this is that a great many people believe that if speeds could be reduced there would be no traffic problem. This, of course, is entirely wrong. However traffic speed is the cause of probably 9 out of 10 of the calls for help that are submitted to our office. Most of the complaints come from the cities and smaller villages, but an increasing number have reference to open rural highways.

After a number of years experience in speed zoning we are convinced that the proper use of speed zoning techniques can bring about a decided improvement in actual speeds on the highway. This does not mean that all roads or streets should be zoned for speed.

To be effective speed zoning should be applied only where it is needed. This should not be confused with the posting of state wide prima facie limits to inform the driving public, especially drivers from other states, as to the existing regulations. A reasonable use of such informatory signs would appear to be desirable.

Where speed zoning is applied the limit decided upon must be a reasonable one. If it is too high it may increase the problem. If too low a limit is posted, it will not only be generally disregarded, but it may actually



encourage higher speeds than would normally prevail. Some drivers apparently accept a low speed limit as a "dare" and will accordingly try to see how far they can exceed it without being caught. The result is a general increase of enforcement problems.

Speed zoning should be based on a factual basis. If limits are established on an opinion basis it is difficult to justify the action taken. Use of the 85 percentile speed coupled with a study of the facts as regards volumes, accident experience, types of vehicles, roadside development, pavement types and widths and pedestrians has proved worthwhile and has furnished reliable data and justification for the selected limit.

Advisory safe speed indications on horizontal curves can be effectively used in many rural areas along with or in lieu of actual speed zoning.

### Highway Delineators as Accident Reducers

MR. McMONAGLE: Highway delineators have a very special place in the accident prevention program. They have this place because they operate at a vital and basic point in the complex of conditions which influence accident occurrence. Before I discuss the delineators and Michigan's experience with them, I think I should make clear how fundamental is their point of attack on the safety problem.

To begin with, I think that we will agree that the various traffic engineering devices and measures are less efficient for safety than are thoroughly adequate highway design, construction, and maintenance. I believe that we also know that as safety factors, both traffic control and adequate highways are far inferior to good driving practices.

Good driving practice, which can virtually offset the exceptional as well as the normal conditions of traffic and facilities, is built up of three major elements. The first is alert and understanding perception of the details of the driver's problem during each instant of his travel on a public road. The second is steady and immediate judgment as to the proper operational response to each successive phase of this problem. And the third, is the mechanical skill to put the decisions of his judgment into quick, effective action.

In this close-knit chain which comprises good driving practice, mechanical skill is the strongest link. The great majority of today's drivers have a really remarkably high degree of operative proficiency. Which of the other two links—perception or judgment—is the more important, is a question. But it is reasonable to argue not only that perception is the initial and therefore the primary factor, but that the average driver, given an accurate view of conditions, will make approximately the right decisions.

However that may be, it is common knowledge that the emphasis of traffic control measures has been and is on reinforcing, or providing a superior substitute for, the driver's judgment. Signs, signals, markings, no-passing and speed control zones—all of these devices and measures aim to aid or take over the function of driver judgment in the interest of traffic safety and order.

Traffic engineering efforts to improve perception until recently have been limited. Very largely they consisted of the installation of signs warning the driver of his approach to hills, curves, and other unfavorable conditions which may be outside his range of vision. These are basically daytime types of treatment, but that does not mean that the special importance of darkness was entirely disregarded.

Several methods have been devised for helping the driver at night, of which the most widely used is the reflectorization of signs and, in the last few years, of pavement markings. This treatment, by making operating directives as legible by night as by day, are aimed to give 24-hour aid to driver judgment. Except in a few instances, it accomplishes nothing significant in the more fundamental field of driver perception.

Unfortunately driver perception is a paramount factor in nighttime driving hazards, as accident records prove. In Michigan, 60 per cent of all accidents occur during dark hours when only about 20 or 30 per cent of traffic is moving; night driving, in other words, is about 4½ times as hazardous as day driving. Inasmuch as perception is the one basic factor which is radically affected by darkness, this statistical fact points up its importance.

More light is the antidote for darkness. The use of artificial lighting to maintain nighttime perception at daytime level is an obvious answer to this night hazard problem. Provision of this remedy was originally left to the car manufacturer, but later the public lighting engineer has taken a hand. Both have produced answers which are effective but which have serious drawbacks.



Modern automobile headlights illuminate the road immediately ahead of the car, but the lighted area is narrow and headlight glare is a frequent menace. Floodlighting the roadway is an almost completely satisfactory solution, except for the fact that the costs of installation and operation are so great as to be warranted only on the most hazardous sections of very heavily traveled rural highways.

Highway delineators were designed to utilize or approximate some of the characteristics of existing lighting methods while avoiding certain of their disadvantages. They use car headlights as their light source; they define the outline of the highway very clearly; they generate no glare; and their per mile cost is by no means prohibitive.

The delineator is a flat metal case with reflecting lenses inset in each face and it is mounted on a metal post. Properly spaced on both sides of the roadway, the delineators brightly reflect the lights of cars from each direction. They plainly delineate the course and shape of the road for a considerably greater distance ahead of a car than is actually illuminated by its headlights.

The special features of the delineators are the quality of the lens material and the method of installation which I will discuss later. The lenses are made of a crystal clear plastic material and are facetted to produce the highest possible reflective power. The mounting of these in practical units and their method of placement along the roadway were worked out by automotive engineers with some cooperation by the State Highway Department engineers.

The initial installation of delineators was made on the 70 miles of US-16 between Detroit and Lansing. It was completed and went into operation in April, 1938. Early in the following year, a similar installation was completed on US-24, from the Ohio state line to Pontiac, through the western part of the Detroit metropolitan area.

In the weeks following the inauguration of delineators on US-16, an opinion poll was taken among users of that trunkline. It indicated that "the delineators were effective in easing the mind of the driver and were apparently increasing his perception distance," and that "motorists were more certain as to the position of their vehicles on the roadway, especially when meeting opposing vehicles."

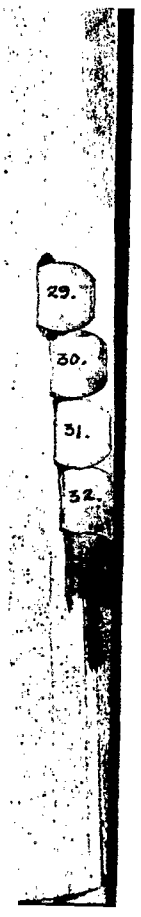
However, this easing and certainty of mind were not universal. Some of the public evidently thought that the reflector units owed their brilliance to a contained electric light source. At any rate, one irate taxpayer-motorist vigorously protested against the waste of public funds in "leaving those lights turned on all through the night." Another protest came from a resident along the route, who complained "that the new lights caused static interference with her radio programs."

Since high night-accident rates on both US-16 and US-24 had led to their selection for delineator tests, popular polls were not the only means used to check their performance. In 1941, a study of before and after accident experience was undertaken, using such accident types as might conceivably be affected by delineators.

It was found that with delineators, the night accident rate on US-16 was reduced 39 per cent. During the same period, there was an 18 per cent reduction in the day rate which, of course, was not attributable to the new devices. As a result, the ratio of night to day accident rates fell from 4.2 to 3.2. In other words, delineators had brought night perception one-quarter of the way toward approximating day conditions.

Similar though not quite such pronounced results were revealed on US-24. On that route, there was a 28 per cent reduction in the night rate as against a 9 per cent reduction in the day rate. Its night hazard ratio was reduced from 5.3 to 4.2, or by one-fifth. Moreover, it was found that on three major non-delineated trunklines having similar traffic and service characteristics, this night hazard ratio had actually increased during the same period from 4.2 to 4.9, or by 16 per cent.

To bring this six-year-old study up to date, the 1947 accidents on the delineated routes were analyzed. It was disclosed that both day and night accident rates on US-16 remained substantially unchanged. On US-24, however, it was found that the day rate was down 30 per cent and the night rate 24 per cent. This additional improvement undoubtedly results from other traffic engineering measures which were taken during



the past three years to deal with special traffic and roadside conditions on this route.

These findings show that, while delineators have limitations, they, nevertheless, definitely help in creating safer conditions for night driving. The limits of the pavements are clearly defined, for as much as a mile ahead on a clear night, and for a distance of from 400 to 500 feet under the worst conditions. Objects on the pavement are more plainly seen and in better perspective, due to the uniform spacing of the delineators. The blinding effect of headlight glare is minimized because the delineators provide points of orientation for the driver's eyes. And finally, the motorist does actually feel more at ease.

On the basis of this experience, the delineation of US-16 is soon to be extended westward from Lansing to Muskegon, a distance of 116 miles including the US-131 Bypass, around Grand Rapids. Plans for this project incorporate some important improvements of the units themselves and of their installation, particularly their spacing along the roadway. These changes have been adopted as a result of operating experience and experimentation by the manufacturers and the Department.

I have mentioned the importance of installation and of regularity of spacing in obtaining the best results. Department engineers gave these matters much study ten years ago in planning the original project. It was then determined that the proper placement of the reflector units was 42 inches above the pavement surface and 8 feet out from the pavement edge in rural sections, but only 4 feet out in sections where the pavement was curbed. The delineators were spaced 100 feet apart.

No deviation from these placement specifications was tolerated for the reason that regularity was judged to be a vital factor in delineating the road and in gearing the driver's eye and sense of position to it. If this spacing placed a delineator in a cross road or other traffic way, it was omitted; the spacing of adjacent units was unchanged.

Subsequent study has confirmed the lateral and vertical dimensions originally specified, but it has revealed the need for modifying the longitudinal spacing. In the first place it was found that on tangents a 300-foot spacing is sufficient. In addition, experience has shown that the original method was unsatisfactory on road sections with horizontal or horizontal curves or with combinations of the two. In such areas the delineators on the two sides of the road were mingled into a confused pattern which had little significance for driver guidance.

A formula for spacing delineators on curves was computed mathematically which, with modifications developed in experimental installations, has proved satisfactory. The spacings on these sections vary from a minimum of 60 feet up to 200 feet in direct mathematical proportion to the varying degree of horizontal curvature or the algebraic differential of vertical curvature, or a combination of both. As seen by the motorist, these spacings are apparently regular whether he is going down hill, up hill, around a curve, or on a level tangent.

The installations on the two delineated routes have been modified to conform to these improved spacing specifications and the same spacing will be followed on the new Lansing to Muskegon project.

In the meantime, the manufacturers of the delineator units have not been idle. They have remodeled the reflector unit housing to prevent the leakage of dust and moisture which frequently caused serious impairment of the lens operation. The material from which these lenses are made has also been greatly improved, with the result that their reflecting power has been significantly increased. These new type units are being put in on existing installations as fast as replacement requires.

In addition to this research and experimental work which has resulted in definite answers, traffic engineers are making other studies. One of these is a test of the use of amber colored instead of the crystal lenses in delineators along no-passing zones. It is hoped that this treatment may provide needed reinforcement to the no-passing restriction during hours when signs and pavement marking are at their lowest efficiency. However, results from this project are inconclusive up to this time.

But as to the delineators themselves, used for the purposes for which they were originally designed, we are convinced of their benefits. Properly installed on routes with high traffic density and a high night hazard rating, they will improve traffic and safety conditions. Michigan's present plans on the basis of its past experience are plain evidence that we think them valuable weapons in the campaign against accidents.



# Operation Safety at Work at the State Level

**(A Symposium)**

*Discussion Leader:* MAXWELL HALSEY, Executive Secretary, Michigan State Safety Commission, Lansing, Mich.

*Participants:*

PAUL EMLING, Editor, Safety Division, Motor Vehicle Department, Madison, Wis.

WILLIAM M. GREEN, Director, Connecticut, Highway Safety Commission, Hartford, Conn.

W. A. HUGGINS, Superintendent, Bureau of Traffic Education, California Highway Patrol, Sacramento, Calif.

CHAIRMAN HALSEY: We have assembled some specific questions, and we're going to start with those. The first question is "What adjustment of the 12 monthly themes is desirable to fit the program of a particular state?"

MR. W. A. HUGGINS: With the usual California modesty, I would like to mention that "Operation Safety" first came into being as such in the grand old state of California. Since then it has been given a great deal of added impetus from many sections of the country.

When this was first adopted nationally, and the states were asked to do something about it, I went into Los Angeles, where Mike Lynch had done an excellent job from a community standpoint, and I took his schedule of organization as the pattern to follow in lining up state organizations.

In my enthusiasm I envisioned 12 months of the year, each month spearheaded by an active campaign backed up by a state-wide organization, with local members pounding the drums for safety. I went at it on that basis.

I was able to get seven state-wide organizations to sign up very readily, and I have five more now on the list, waiting for final approval of their top organizations. I have run into some difficulties, however, which I would like to call to your attention this morning. I bring them out not to discourage you and your work with "Operation Safety," but to point out some of the pitfalls upon which we might fall if we do not beware of the obstacles to be faced.

I have reference to the fact that on a state-wide basis it is impossible to chop off one month's program immediately on midnight of the 31st of July and start another one on the 1st day of August. It's very fine to take your 12 months' program and have each particular theme before the public all the time, but it is much better to be able to do an outstanding job four times a year, say, than it is to have a weak job all the time.

If you will take the four seasons of the year, or take four particular subjects such as school safety, vehicle check, holiday accidents, and speed, and assign those to four big organizations capable of conducting outstanding campaigns, you're going to have a great deal of activity between these periods that will carry the program through without any letup.

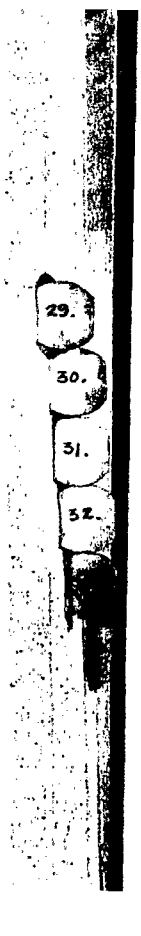
If you have your Junior Chamber of Commerce, for instance, working on a program for the month of July, that group is going to be busy weeks in advance, preparing material, visiting the newspapers, preparing outdoor advertising and contacting radio stations. All of these activities will be carried on weeks in advance of the start of that particular month's campaign, and the interest and enthusiasm is going to carry over beyond that period. You can't confine them within the 30 or 31 days of the month.

I think if we can keep the public informed all the time of these various monthly themes, we can get somewhere.

Keep those things before the public. They are the accepted practices of the safety program. But let's give our "Sunday punch" to about four separate, outstanding programs for the year, with big organizations capable of doing a good job. I think in that way we're going to be able to get the maximum benefit from this program.

You men on the local level who are attempting to do the job, if you know that the top level groups in your state are working with you to make four big programs of a year's work, rather than trying to scatter their shot over 12 just ordinary programs, your work will be much more effective. I think you'll derive considerably more benefit from it.

CHAIRMAN HALSEY: We have had the same feeling in Michigan, dating back



to the first brake check program. Our police and safety officials figured they needed about six weeks to run a good statewide program. After the six weeks you'd have to have a couple more weeks to get set for the next one, so we, in Michigan, have been following the same general plan of projecting three or four programs.

It is necessary to make one distinction, and that is that there is no reason why in some of your media—for example, take your outdoor advertising—you can't hit all 12 monthly themes. There is no reason why the local chief of police can't go down and get something in the papers on each of the 12 monthly themes.

But when you're going to get all geared up to go at the state level, I agree that it is better to do a good job on four of them than to do a poor job on 12.

Question No. 2 is: "What adjustment of the physical kits themselves is desirable to fit the situation within a particular state?"

MR. WILLIAM M. GREENE: We have 33 cities in our state with a population of over 10,000 that we think are the type of communities in which a program of this type might be activated, but they require a lot of direction.

We get the material and put our own cover on it. We started out first by going around with this "Operation Safety" kit, a wonderful tool for the presentation of the material.

In past years we have been developing material along the same line, but we stapled it into programs, which is ridiculous.

The first kit came in the summertime, and we went around to the chief executives of the cities with it. We didn't bother with the chiefs of police or the town engineers or the superintendents of education; we went in and talked with the mayors and the first selectmen and showed *them what a planned program could be.*

It was generally very welcome for the simple reason that we had our thinking done for us.

We find 12 monthly themes is altogether too fast, because we don't have time for them.

We followed up our first calls by getting a number of copies and sending them around the state, to let the others mull it over and chew it over.

We got the September and October themes and made up our own cover, so we'd always be in the picture, so it would be coming down from the Highway Safety Commission, at the state level.

We have our own program, including our annual pedestrian project, which we have activated for the last ten years from the middle of October to the 30th of November. Our experience has always been that there is a carry-over into December, and we tie that in with holiday hazards. We finish up the year with material about drunken driving and all that sort of business.

We have put out our own "Operation Safety" kit on that. It is quite extensive, based on what we have learned from the way this original "Operation Safety" was put out.

I have a letter from the governor and the chairman of our commission, and we have taken the various functional phases and put that over in the right-hand side, with a number of folders and other things we got from different companies like the Metropolitan Life Insurance Company.

We really have produced a very creditable pedestrian safety program for this six weeks period, but based entirely on our own thought. We have given entire credit to the original "Operation Safety." We just simplified it. It is a constructive criticism, I hope, of the physical presentation, that the state didn't figure into it.

We want to keep a close tie-up with the communities, because, after all, our state program is only as good as the community program.

Our 33 cities of over 10,000 are charged with 70 per cent of our traffic accident problem in Connecticut.

We have the very simple responsibility of continually upgrading the programs in those 33 cities. We want to keep a very close contact with them, and we are bringing these kits around and putting them right in the hands of the chief executive and impressing him with the importance of it. We suggest that he call the chief of police and the town engineer and the superintendent of schools and discuss it with them. We also see that they get kits, the functional phases which he has right before him.

With all these different facts presented to him there isn't one of the town officials who can start to beg off and say "We haven't time or facilities." We can say, "Here's all your thinking done for you. All you have to do is follow instructions and activate it."



MR. HALSEY: Apparently you have picked out these 33 cities simply on a priority basis. I assume that you would like to take on more cities with parts of this program, if staff time permits. What are you doing about that? When can you move into the smaller communities and help them?

MR. GREENE: We have 60 cities over 10,000, and there are 27 cities in that 5,000-to-10,000 group. The 33 cities over 10,000 we already have in the National Traffic Safety Contest. A good many of the 60 are towns, and not cities. Those 60 are in the pedestrian protection section of the Triple A contest. It's no boasting on my part, but you'll see we are one of the comparatively few states that succeeded in getting 100 per cent of all eligible communities enlisted, and 100 per cent of reports in. That was done by contacts. A good many cities are indifferent, or their men are too lazy to write their reports. We have a field man who goes around to sit down and talk with the city officials, to help them make out their reports, so that every one of our communities gets in a report for both contests. It takes a lot of field work, but it is worth while.

We have to do considerable of our work by correspondence, of course, but we have three men who get out in the field, and we figure on covering these different communities at least twice each year. What we do is to follow them rather closely. On the communities that apparently are doing a good job, we dash in quickly and find out what miracle has come to pass there. We check the towns which are not apparently getting anywhere, and try to write to them about the things their neighboring communities are doing. They take that because we're not going down from the state level and telling them how to do it. For instance, we go into Bridgeport and say, "Do you know what they're doing in Waterbury? The Waterbury police department is doing a swell job in public relations." Then we have been pointing out that "Operation Safety" supports what we have been trying to bring down.

The average chief of police has been very slow to realize what he can do. The fire chiefs are away ahead of them. It's high time the police chiefs went out and sold themselves.

We are finally getting the police chiefs to see these things. Of course, the Midwest and Far West don't have the conservative individuals we have back east. When a police chief has been in for 25 years, it's tough to convince him to change his ways.

I was astounded to find out that one of our oldest police chiefs had accepted an offer to have a microphone placed in the office so they could broadcast three times a day from the police department. They are broadening out and asking for help on radio programs and different things of that kind.

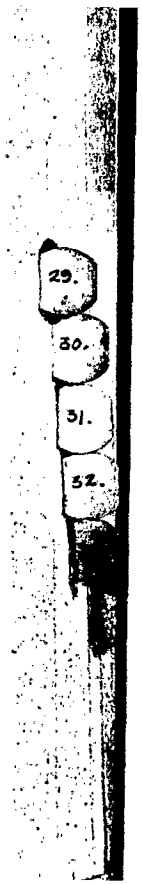
You who are working on the state level, where you have National Safety Council affiliated chapters and experienced individuals who will do this thing automatically, you're in fine shape. Unfortunately, in our state we only have two affiliated chapters, and only one of them really does a job, so we have to build up the community organizations in these other cities. It takes a lot of field work.

In the last analysis, this is fine, academically. It still takes a lot of contact work, but it gives us something to work on, a tool to go in with, an entrance so we can sit down and give a good reason for our visit, and not just a "back-slapping" contact.

MR. HALSEY: Question No. 3 is: "What supplementary materials can be added to the kit and the monthly theme to make the program more effective?"

In Michigan we wanted to sharpen the speed theme a little bit, so we developed our own poster, which is a picture of a speedometer with an arrow pointing to the figure 25, the basic speed limit in all of our cities, with the caption "It takes 60 feet to stop." That was a supplementary thing which we did in Michigan, because our police asked for something sharper than just the slogan, "Speed kills."

Next our police committee met and told us that they would like to inject into this program some training. As they said, "If we're going to go to the public on the subject of speed, and build up all this commitment about it, don't you think we should do a little bit about training officers in doing a better job of apprehending speeders?"



In Michigan, working with the International Association of Chiefs of Police, we prepared a 35-page training manual on the apprehension of speeders. We offered that to our communities, with a return card, and 71 of them ran training schools, using this manual as a part of the operation on speed control.

In the coming program on the holiday hazards, we are intending to use the chemical test, publishing material in the interview check list for interviewing drunk drivers as a part of it. We think those are both supplementary, good pieces of material where you have field service and your men can go out and explain them.

Certainly, when you talk about supplementary material you have to be careful that you're not thinking of overloading this kit. This kit has now reached enormous proportions, so that it might scare the average local chief of police when you lay it on his desk. We're not talking about getting a bigger or more bulky kit, but we are thinking of adding some very specific, practical things to it that deal with the day-in-day-out job of the educator, the chief of police, and so forth.

MR. GREENE: That manual made such an impression on our commissioner, Ed Hickey, that he immediately got 300 copies, one for every member of his department. He sent out orders that they were to read them, and the barracks commanders were to catechize their men to see that they did read it and benefit from its contents.

It's true about the supplementary material. When we sent out our pedestrian project program, we had it lettered on the front with the words, "For the consideration of—" and then we lettered in the name of the official who was going to get the kit—the mayor or chief of police—so there was a personal aspect to it, as if it had been prepared for that individual.

We had so many individual booklets and so much supplementary material that it was foolish to load down the kit with it, so we sent the kit out with all the essential, basic material. Then we divided up the supplementary material into three groups, and we are sending that out each week, so as to maintain their interest in the program, feeling that if they got it all at one time, they'd push it to one side. That also gives us at least three more contacts during the project.

MR. HALSEY: Are you actually breaking your kit into three sections?

MR. GREENE: No, the kit is in one, but we promised to send out the material, and each week we send out the booklet, and so forth, as material to assist them as they go along. We think that sustains their interest in the project, too; they don't forget about the program so soon.

MR. PAUL EDLUND: In the July kit it was mentioned that National Farm Safety Week was held during one of the weeks of July. Before that week, the Safety Division of the Motor Vehicle Department cooperated with the University of Wisconsin's College of Agriculture in preparing this small folder, "Traffic Accident Facts for Wisconsin Farmers." We made a special study to determine just how the farmer figured in this traffic accident picture, and we found out that one out of every five persons killed in Wisconsin traffic was from agriculture. Out of the 139 persons involved in 1947, for example, 65 were farmers, 20 were farm hands, 13 were retired farmers, 11 were farmers' wives, 11 were farm youths 6 to 13 years of age, 10 were farm youths 14 to 18, seven were pre-school age, and there was one cheese maker and one cattle buyer.

This leaflet had very fine acceptance by the county agricultural agents, to whom we distributed quantities we felt they could use. We also distributed it through the vocational schools' agricultural departments, and through the Four-H-Clubs and the Grange societies.

Now for the November theme coming up—pedestrian safety—we have on the presses at the present time 100,000 copies of a pedestrian "facts of life" leaflet, giving the Wisconsin facts on pedestrian accidents for 1947 very briefly, carrying about three or four illustrations. That will be distributed through police departments, through safety councils, through chambers of commerce and through your regular service and civic groups.

MR. HALSEY: In Michigan, which is pretty heavily industrialized, we found that only one out of seven people involved in fatal accidents was a farmer, which obviously isn't as high as your proportion there. We found that every second man worked in a factory, so our supplementary action would probably deal more with the factory worker.



The next question is: "How much field service is needed to encourage all communities to participate?"

MR. GREENE: We have three field men who spend practically all of their time in that work. I have a staff of eight. We have three field men who spend practically all their time, weather permitting, on the road. I imagine that we'll put in at least a hundred thousand miles of motor travel a year in those three men.

Now as I said before, we make our contacts where we think they will do the most good, and we try to pit one city against another by pointing out that one community has done something the neighboring community hasn't done.

We do a great deal of field work through our state police organization. Our Connecticut police chiefs meet every month, and we present everything to them and get their approval and get them behind that.

We are running a project on Route 1, our main highway. Before that project was put in, we talked to the state police about it, and the commissioner was all for it. Then we put it up to the Connecticut chiefs of police association, and they were all for it. That committed the police chiefs in the 20-odd towns down there, so for the month of October there is a traffic detail of a couple of hundred policemen—between the state and municipal forces—who are giving traffic some very intensive supervision on that road.

Incidentally, I might remark that we have no speed traps or enforcement traps.

When we have a special project on, we get the highway department to put a big sign at the beginning of the route—"This route is under special police patrol." If anybody comes wheeling in from New York and drives 60 to 65 miles on the route, they have no complaint when picked up, because they were advised.

Now to get back to the field work, we found we weren't contacting the town engineers too well, so some years ago, in conjunction with the highway department, we organized the Association of Street and Highway Officials. Then we worked through the Association of School Superintendents and School Principals. In everything we do from a state level, we go through the state organizations, and then through them we get down into the municipalities. Then we supplement that after fully acquainting the members of the state organizations with what is going on, and having their seal of approval put on the plan. Then we send our men in to contact and do the usual stimulus work there.

We find that you can't make too many contacts. Of course, we have a small state, and our men can go to one end of the state and be back at home that night. It's not like these other states where you'd have to stay at least one night or two nights, if you make a long trip.

The kind of field coverage we can afford in Connecticut and some of these smaller states would be very difficult for some of you larger states, but, the way we look at it is that we have an idea to sell—accident prevention—and it's a matter of selling, selling, selling all the time.

The selling job is a little difficult because it's intangible. You're not putting something specific and concrete across, and, worst of all, you're going around to some city officials who have been sitting back and taking it easy for some years, and suggesting that they dust off and get out and go to work. That has to be done in a very tactful way.

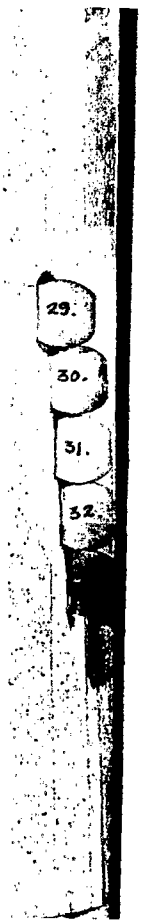
My answer to how much field work is necessary is, you need all the men you can get, and you should keep them out on the road as much as the weather and other demands will permit.

MR. HALSEY: Here's the next question: Is there any practical way of dividing up the public support items, such as posters, leaflets, manuals, newspapers treatment, radio, and so forth among the sixty to a hundred-odd public support groups we have in most of our states?

MR. EDLUND: In Wisconsin there are certain agencies that lend themselves well to the promotion of traffic safety through the medium of radio, and there are other organizations that can do it best through newspapers.

For example, the Insurance Agents Association in Wisconsin has been very interested in promoting the advertising urged by the Association of Casualty and Insurance Companies of New York, and in a number of Wisconsin communities the local and regional associations have backed that particular phase of the program rather than the whole.

In Wisconsin we have developed a new



idea in cooperation with the Wisconsin Association of Outdoor Advertisers. In a meeting this month, the outdoor advertisers of Wisconsin created a space pool, and they have allotted 100 panels for the next 12 months, beginning November 1st. Each 60 days the poster will be changed, and imprinted on the posters will be the name of the state-wide organization cooperating during that 60-day period with our official state safety promotion agency, which is the Safety Division of the Motor Vehicle Department.

We have already secured approval of the Wisconsin Junior Chamber of Commerce to have their name imprinted on the posters for the months of November and December.

A manual was published at national Jaycee headquarters, prepared by Bill Porterfield, Jr., who is chairman, Bob Richards, who is external affairs department secretary of the U. S. Junior Chamber of Commerce, Wally Porro of WHBY, Appleton, Wisc., and myself as vice chairman of the public safety committee of the U. S. Jaycees.

This manual will go out to 2,000 or more local Jaycee units throughout the country, and in Wisconsin we hope to do the best job of any state among the Jaycees during the 60-day period of November 1st to New Year's Eve.

Last year in Wisconsin the Jaycees promoted a "Save a life" campaign, stressing winter traffic hazards, holiday hazards, and so forth, from Thanksgiving through Christmas and New Year's, and also pedestrian safety. We're going to improve that program and do an even better job this year.

Last year we issued certificates of award to the best communities signed by the governor, and this year we will present awards again.

After the Jaycees have completed the 60-day program, we will start in January and February with the Wisconsin Automotive Trades Association, bringing in the automobile dealers of Wisconsin. There are a number of other organizations that have not yet committed themselves but with whom we are in contact in an effort to secure their approval for the other 60-day programs.

I mention this 60-day proposition, because it was mentioned by the other member of the panel that a 30-day period was not sufficiently long to promote a good state-wide program. We are going to experiment in Wisconsin with this 60-day proposition, and we believe we'll be able to accomplish something along that line.

MR. GREENE: How many Jaycee groups are there in Wisconsin?

MR. EDLUND: Forty-five.

MR. GREENE: Do they adequately cover the whole state?

MR. EDLUND: Pretty well.

MR. GREENE: In some states they don't cover, and you couldn't turn a project over to them.

MR. EDLUND: This will serve as an extension project possibility. The Milwaukee Jaycees will be able to urge support of traffic safety through Jaycees in communities all around Milwaukee, for instance.

MR. GREENE: Do they lead the project in Milwaukee, or does the Milwaukee Safety Council lead and they help them?

MR. EDLUND: The Milwaukee Safety Council is over all.

MR. GREENE: You don't turn a project over to a group to activate and lead it?

MR. EDLUND: State-wide our state department has to direct it.

MR. GREENE: That's right. They help out.

MR. EDLUND: And locally the safety council is above the cooperating organizations.

MR. HUGGINS: There are two phases of the public safety program that do not come under the heading of general public safety work. I mean they don't utilize your outdoor advertising or newspapers so much as you do. I have reference to the activities of the Federation of Women's Clubs and the Parent-Teachers Association. Those two organizations in California have accepted assignments for two months, and through their regular meetings and contacts with school people and housewives, they are going to be able to do a tremendous safety job that will reach into the homes. The general public may not hear much about it, but they will be part of the over-all state-wide program.

The funds are not sufficient for them to carry on an outdoor advertising campaign, but through their organization they can reach thousands of people.



In California we now have a very active organization program under way for organizing local safety councils, spearheaded by a representative of the State Insurance Association. They are working throughout the state with us, and everywhere they are planting the seeds of "Operation Safety." We know what they are doing, whom they are visiting, what their program is, what their schedule is, all the time.

The automobile clubs have given us outstanding assistance in promoting public interest in this state-wide job of mobilizing public opinion behind our program.

Out there everybody is trying to get into the act. Safety is actually getting popular.

MR. HALSEY: I would like to go back and re-emphasize the distinction between concentrating on four programs a year and also doing something on all 12. I'm afraid that if we talk about this concentration on four, unless we go into a little more detail, a lot of people will say we're backing away from the whole 12 months' program. Of course, we're not. In the larger communities such as Los Angeles and Detroit they are staffed and geared up and have so many more resources that they can make a larger number of programs available consistently all year than can the smaller communities.

But when you talk about linking this thing to a police activity in several hundred communities, that takes a different kind of organization and a lot more time to get set for it.

The last question "How can 'Operation Safety' be refocused slightly to accelerate the adoption of fundamentals such as police training, chemical tests, driver education, and so forth?"

In Michigan our police officials felt that they preferred those particular themes of "Operation Safety" which built support for specific things which their people could do. In other words, when you take a theme like courtesy, the chief of police throws up his hands and says, "That's fine, but we can't do anything about it. If you take something like 'speed,' we can really get in there and pitch."

That, of course, is what led to our developing of the first training manual on the apprehension of speeders.

I would submit to you that regardless of all the publicity which we get, which we badly need, the things that are going to pay off most in the long run will be police training, driver training, chemical tests, vehicle inspection, and fundamentals of that type, and if we can utilize this fine mechanism of "Operation Safety" by turning the dial slightly to encourage local communities to do these things and encourage the legislature to pass certain laws, I think our gain will be a hundred to one compared to merely a monthly theme.

MR. EDWARD P. TINKER [Nebraska State Safety Council]: I'd like to ask the gentleman from Wisconsin how or who foots the bill on these 24-sheet billboards in connection with the program you outlined.

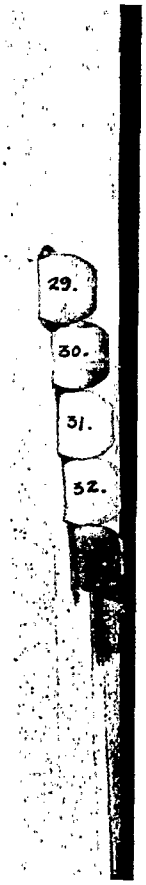
MR. EDLUND: Commitments have been made by plant operators throughout the state, and the plant operators have agreed to take two, four, six, eight or some number of posters for the 12-month period. One or two operators indicated they would try at first for six months, and if it works, fine; they will then take it for an additional six months. But 98 per cent of them go for the full 12 months.

This space pool is turned over to the State Motor Vehicle Department without any cost to our department and without any cost to the state-wide cooperating association.

We definitely will instruct the local chapters, clubs or units of the state-wide organizations cooperating during this 60-day period to work in close cooperation with recognized safety councils.

MR. MORRIS J. CARTER [Indiana Traffic Safety Commission]: On our May and June theme—"Check your car; check accidents"—the public was very receptive to that. In the absence of a compulsory vehicle inspection law, I wonder if any states have repeated on that program in the same year, and what the feeling was on that?

MR. HALSEY: In Michigan, we developed that original brake check block, and we are finding that a very large number of our police departments have never stopped using that check. Frankly, I do think that there may be some merit to considering going back to single items. I



suspect that you could do a better job on headlights alone than you could on headlights plus 20 other items, the same as you could do it with brakes alone, rather than brakes plus 20 items.

We are still in bad shape on testing equipment of the inexpensive type.

MR. GREENE: The state police in Connecticut did that by making a special drive on headlights, and for one month they made a survey on all the highways, to approve or disapprove the theory that operators were being subjected to a lot of unnecessary glare at night. After a fairly good survey we found out that only about 10 per cent of the operators were noticing their headlights.

The commissioner of state police figured out that it meant around 55,000 cars at night. He said the percentage might be all right, but numerically it was all wrong, so he ordered that they be clamped down on, and that was utilized in newspapers and radio publicity, and very effectively, and followed up on the usual vehicle inspection.

MR. CARTER: No special preparation from your office.

MR. GREENE: We worked very closely with that. In our state we get the promotional men from all the departments together, and on that we would take the officer in the state police who is working on publicity and we would work with him, so we wouldn't duplicate in any way and yet we'd supplement whatever he was doing, and lend whatever support we could to it.

We also had another little thing on the follow-up that might interest the people here. You're probably all interested in this problem of the left-arm driver. Numerous appeals have been sent out for operators not to drive that way. Well, with the cooperation of the state police we developed a picture of how a chap should drive, and made up a 3-column mat and sent it out to newspapers, urging them to use it, on the old Chinese theory that a picture is worth ten thousand words, and so forth. Knowing how blase a good many city desks are, we sent along several photographs of arms lying in the highway as a result of those accidents, and that so convinced the editors that what we said was true and not a lot of hooey that we got general use of that mat in the papers, which was much better than any story on the thing.

MR. FRANK ULISH [Iowa Safety Council]: During the month of September the American Legion took over the "Operation Safety," and they did a fine job in Iowa. With 800 posts I was able to get local newspapers to use a lot of child safety material, not only from my job as director of the safety education of the state, but as safety chairman for the American Legion. With 800 posts, and an editor of a legion paper that is very safety conscious, there is an outlet we don't want to overlook.

We have a contest on for Junior Chambers in Iowa, sponsored by the A. H. Blank Theaters. Boone, Iowa, turned over $1,000 to the local safety council to use, which we thought was a fine tie-in.

The PTA, the Junior Chamber and the American Legion in our state happen to be the leaders that are taking this "Operation Safety" very seriously. I do hope you'll take advantage of the American Legion posts, because, as you know, every state Legion organization has a district safety chairman, and every post has a safety chairman. If you have a good state safety chairman, you have a fine outlet to hundreds of contacts in the community.

MR. EDLUND: We are expecting to use the veterans' groups.

MR. HALSEY: There was no intent to overlook the American Legion, any more than any other of about 30 fine state-wide organizations. I am a little disturbed in some areas where any one organization moves too aggressively to the point that they make other people back up a little bit, so you have a problem of balance. At least I'm finding that in my area. You have to restrain some so they don't make the other people feel that "we don't have to do anything because somebody else is taking it over." You can use all of these people very effectively.

MR. JACK MAISH [Traffic Safety Council, Cincinnati, Ohio]: I'd like to ask the panel their advice about the use of radio with respect to announcements. In Cincinnati in the last few years we found that it is rather difficult to get short announcements on the stations, largely because they are using them either in their network programs or in the National Safety Council material. They are using them consistently, although they are not using the strictly local ones.



I don't know how many of the state announcements coming down from Columbus are used. We're getting plenty of coverage on the stations, but not getting the local announcements that we used to get.

I wonder if it's better to let it trickle down from the top or try to get it down from the bottom.

MR. HALSEY: I'm a great believer in city rights, state rights and local level rights. I would urge that you continue to work directly with your own people.

In Detroit we had no difficulty at all in getting 100 per cent cooperation from the local stations. The state police went out to every radio station in Michigan and didn't get a single turndown. Incidentally, they took the national script and rewrote it to fit Michigan conditions. Last year when Colonel Watson of the Motor Vehicle Department came back from the Safety Conference, he was imbued with the idea of a campaign using "Scotchlite." The Colonel and I were down to see the State Department Commander of the American Legion and talked with him, and the State Department of the American Legion in Connecticut adopted the whole thing to work in cooperation with the Department of Motor Vehicles. It was a Department of Motor Vehicles project, assisted by the American Legion posts, and it went right down into various posts. We went around to the different posts and to district meetings, and steamed them up. Of course we had the usual experience—some posts did a wonderful job, bought all the material and put it on the bikes themselves; others did a halfway job, offered the inspection service and had the children pay 15 cents.

Incidentally, we found that is just about enough for one year, too, in conjunction with all the other things an American Legion post has to do. When they got through monkeying around with the project, they didn't want us to come around with any other project.

MR. HUGGINS: In California we have more than 700 Legion posts that have accepted the program. We had thousands of inches of newspaper space. We had a great many radio programs, and quite a few billboards. Next year we hope that some adjustment may be made in the monthly assignment, because September is a difficult month for the American Legion to operate in because of the change in officers and the preparation for the national convention.

Going back to radio, we now have our own programs on 28 smaller stations in California, where our highway patrol captain is known and respected. The smaller stations are glad to get live programs, so we're sending out programs now, prepared in our office, and "Operation Safety" is emphasized every month on these programs.

We're bringing in local people to participate, sometimes on quiz programs, sometimes in plain interview programs. We hope soon to have that extended to about 30 programs a month all over the smaller stations of the state. We're sending out the spot announcements all the time.

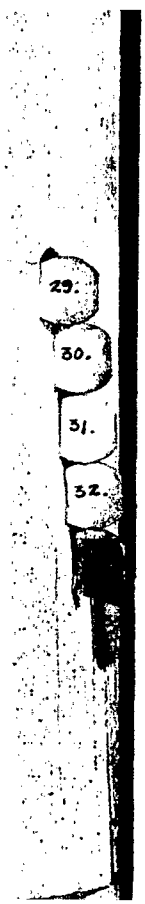
QUESTION: I'm a firm believer in what Mr. Greene says about the contacts, but I'm sitting there in Indiana and I'm the only field man in the office, and it's a pretty hard state to get around. Now I wonder if there has been any experience in this room with safety commissions or councils—whatever it might be—using other personnel, state personnel from other offices, for contact men. Is there any such setup anywhere?

MR. HALSEY: In Michigan we have been using our state police very heavily, along with representatives of the Motor Vehicle Department. We have even used highway department district representatives. I think you should take advantage of every state agency that has districts and field men.

QUESTION: Are they assigned to a certain degree to your office?

MR. HALSEY: The thing is set up on a project basis. We sit down with the highway commissioner, the head of the state police and the head of the motor vehicle department and get a commitment—during such and such a period our field men will go out and they will do thus and so. So we know we're getting coverage.

You can argue back and forth as to whether, in the long run, you can staff your own outfit, if you can get money for it, or use the existing people. I think



that probably you're going to end up with a combination of it. How about it?

MR. GREENE: Massachusetts has done that for years. The state police department has assigned men in different districts to do that, and just now Registrar King has about 30 of his inspectors who are being used for the promotion of safety around the state. Of course, he is more or less the coordinating agency there, so it would fall on him, but you also have the Massachusetts Safety Commission.

In our state we use the representatives of other agencies. As a matter of fact, the state police will undertake to cover every school—not necessarily every community but every school—in rural areas, and that work very much lightens the work of our staff.

MR. TOM RYAN [Division of Safety, State of New York, Albany, N. Y.]: Apropos of the question from the gentleman from Cincinnati about the radio, we in New York State have found that the division of radio publicity—which was organized at the request of the radio stations—has proved very effective.

It seems there is a real skill required in writing spot announcements, and apparently there was confusion of ideas, so at the request of the various radio stations this division of radio publicity was formed.

It works something like this: For instance, we in the division of safety might take the "Operation Safety" packet and condense it into what we think would be good spot announcements. The conservation department—especially in view of the forest fire conditions that are prevalent during this time of year—might write special articles with reference to that. The state police might find that a large number of cars are being stolen because of people leaving their keys. The motor vehicle bureau might want to bring out some message about renewal of operators' licenses.

There is a real skill in making up these spot announcements. They take our materials and then condense them, and this packet is sent to each and every radio station in New York State every week. In addition, they select one subject for a 15-minute standby, and we have found that the radio stations are very happy about it, and we have found that the spot announcements are used quite extensively.

We work with the various local agencies and tell them about these packets, and they contact their friends in the radio stations and the thing is all made up, and we get pretty good coverage that way.

MR. HALSEY: I'd like to express my own personal opinion that, in general, spot announcements are a better deal than 5-minute, 10-minute or 15-minute programs, unless those programs are put on as an actual play or skit by the station itself. We have had great luck in Detroit in getting the stations to develop their own programs, which are obviously professional.

MR. ARTHUR H. ROWAN [Ontario Department of Highways, Ontario, Canada]: I'm wondering if any of the states set aside public funds for safety work.

MR. HALSEY: The answer is, of course, yes, quite a lot of the states.

MR. ROWAN: I mean apart from the operation of the safety patrols.

MR. HUGGINS: In the state of California, we are fortunate in having $24,000 appropriated for safety education alone. That is in addition to the rest of our operating budget.

MR. ULISH: We are spending $4,000 a year on education, devoted entirely to work with the Safety Council and the other organizations.

MR. TINKER: Nebraska sets aside 2 per cent of the driver license fees for education.

MR. HALSEY: That is done by statute, is it not?

MR. TINKER: Yes.

MR. HALSEY: I assume these others are, or is that a budget matter?

MR. HUGGINS: That's a budget matter.

MR. JOSEPH MURRAY [Dallas, Texas]: We had some difficulty because the town has six or seven stations. There is usually rivalry and duplication of effort. We got representatives of all the stations together, and they organized themselves into a cooperative group. Each month one of them assumes the responsibility for getting these spot announcements in the form that you put them out. They take the material we give them on "Operation Safety" and whip it into line, and on a rotating basis it has worked out very beautifully in Dallas.



# Operation Safety at Work at the Local Level

**(A Symposium)**

*Presiding:* EDWIN S. SMITH, Director, Rochester Safety Council, Rochester, N. Y.
*Discussion Leader:* COLONEL F. C. LYNCH, Secretary-Manager, Greater Los Angeles Chapter, N.S.C.

*Participants:*

ROBERT A. CAMPBELL, Secretary, Peoria Traffic Safety Plan, Peoria, Ill.

DAVID KAYE, Managing Director, Spokane Area Safety Council, Spokane, Wash.

JOHN W. STOVER, Chief of Police, Bristol, Va.

COLONEL LYNCH: We have had the three E's of safety—Engineering, Education and Enforcement for years. We are still working with them.

The place where we have failed is that we haven't sold our program. We opened up the big store and forgot to advertise. "Operation Safety" was designed originally—and we still think that is the philosophy of the committee—to be the selling agent, not to substitute for Engineering, Education and Enforcement. It has nothing to do with 'traffic engineering; it has nothing to do with police techniques—that is still the program that must be carried on in your community by technical people who know what to do.

This is the program which creates and crystallizes public opinion. If we just keep that philosophy in mind when we criticize "Operation Safety," then I think we can get the answers much easier.

It is the only thing that we have ever had in safety where we have all attempted to do the same thing at the same time. It is the only package we have been able to hand out and let somebody else in the community do it. It is the only package that you can give to a little safety council in a small town.

We have organized them. There has been quite a battle as to whether we could organize them faster than they died. There have been times when they died fast and times when we have organized them fast. Why? Because we have never had anything to give those people after we organized them. Now we've got something.

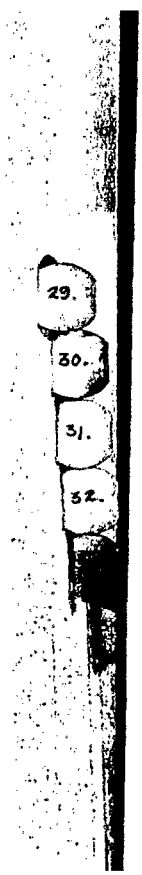
Our friend Jackson here, of the National Automobile Club, spends all of his time working through the Insurance Agents Association, going into the communities, getting the insurance agents sold on the idea that they ought to have a safety council. They call a meeting and decide to organize one. Then *they call a meeting* of 12 other organizations and they decide they will have a safety council. Then Jackson steps out of the picture. He says, "That's all right; you keep going now." They take out a membership in the National Safety Council. They get the "Operation Safety" kit. Each one of them says, "All right, we'll take one month." Then in that community you know you have a program going, and you know it's going to go each month if each one is going to be honest and do his job. Of course, some will do better and some not so well.

Right in the city of Los Angeles, where I run a safety council, Jackson is organizing safety councils. He organized 15 out in North Hollywood.

There they have a little community interest in safety. All that these small groups are doing is carrying on "Operation Safety." In other words, they are "softening up the enemy" out there so the people will accept Engineering, Education and Enforcement. They have gotten everybody safety conscious, and in that way it really is going fine.

To show you how it works in Los Angeles, we are not going to take much time, but Cheney is the man with the Automobile Club of Southern California who is charged primarily with the job of safety education work in the schools, and he also happens to be the safety chairman or technical adviser for the Boy Scouts. Now when next month rolls around, we just turn over that month of "Operation Safety" to the Boy Scouts. We don't have to worry about it.

MR. ROBERT CHENEY [Automobile Club of Southern California]: In the month of November the Boy Scouts of the



Los Angeles Council, numbering about 36,000, will do something rather unique. In 17 districts in greater Los Angeles they will take over the program and "picket" for safety. We have had all kinds of picketing in California, but we don't think we have ever had any picketing for safety.

They have an extensive radio coverage for the month.

They will use such media as a Goodyear blimp with a running electric sign. There is another one that will be used in Hollywood.

They'll have a grass roots campaign of taking this program right back into the homes of all the Boy Scouts, and there are many other things that will be done by the Boy Scouts in the program next month which time doesn't permit mentioning.

MR. DAVID KAYE: When the Spokane Area Safety Council was organized in February, we immediately attempted to do some of the things for which a community safety council is organized—to coordinate some of the activities of that area, to mobilize the potential forces, to bring about a program which would immediately have an impact on the general public so they would know there was a safety council in operation in Spokane.

We picked a project or a program of public interest, traffic accident prevention. When we opened our offices, we had available to us a program on traffic education that we could take to other organizations and use as a specific entering wedge. We would not go to them and say, "We have organized a safety council in Spokane; we need your help." We went to them with a specific program, and we said, "We believe that we can help your accident prevention committee to do a job in this community through a traffic accident prevention program, through an educational program which will whet your appetites for something in the future."

We opened our offices on a Monday morning. The following Sunday evening we had our first radio program sponsored by the Junior Chamber of Commerce, and during that month of February they conducted, on a small but active basis, the February program.

Prior to March we presented a program to the P-TA—"Watch Out For Kids." That program was conducted by the Parent-Teachers group in March.

In April we had the personal responsibility program, "It Can Happen to You." The safety council, in preparation for the fund-raising campaign which was coming up in May, decided we would sponsor this ourselves.

In May we had the "Check Your Car, Check Accidents" program, and there was no more logical sponsor than the new car dealers in the city of Spokane. We had learned something in those previous months. We had no idea what the program was going to cost, we went to them and said, "Here's a program. You can spend a hundred dollars, you can spend a thousand dollars."

We knew that the new car dealers had a little money, so we went to them for $500. I was astonished. There were no questions asked. So they gave us the $500 for the "Operation Safety" program in May.

In June the Lions Club in Spokane sponsored our program. It was not as successful a program as it might have been, because of the fact that they felt that during June they would like to have the program because they were having a convention. Little did they realize that most of their manpower was busy on the convention, and not too much time was spent on the program.

We have been successful in the nine months of operation in planting that program with six different sponsors. As a result of our whetting the appetite of the Junior Chamber of Commerce in Spokane, they have been conducting, along with the other monthly theme programs, some stunts and have given out some information with respect to the pedestrian safety program which will be the climax of their activities in November. I don't know all of their plans for November, but I do know that they are ready to climax their so-called smaller operations in pedestrian safety during the past several months with a fine program during the month of November.

These programs are being conducted in cooperation with the activities of our police department. One of our men is a sergeant at the police department, and we consult with him on all of our activities, because eventually we are going to put on a "souped up" operation that is going to be based on certain surveys being conducted in Spokane at the present time. If the particular theme of the month is not just exactly the one that we will want in order to tie in with our national program, we will conduct in connection with that program the one that is really adaptable and most needed in the city.



I understand that "Operation Safety" has been claimed by many, many organizations. We don't care who has claimed it —we think it's a wonderful program. We believe that if you people will use it, you'll get results.

MR. ROBERT A. CAMPBELL: Back about February, Tom Burke came down to Peoria to make a talk. It was then that I really realized what "Operation Safety" meant.

It was only five days later that we called an emergency meeting in the city council chambers. The mayor put out the call, and 87 people, representing the civic leaders of Peoria, came together.

I took them back to 1935, when they rose up in wrath against diphtheria and really did something about it, and I tried to show them that this has been an equal epidemic, year in and year out, in Peoria, for the past 13 years. There has been an average of 18 deaths per year. Last year we had ZZ.

I showed them "Operation Safety" and asked them if they would take part. They started signing up right and left. I had the whole year signed up.

We had four deaths at the time when that meeting was held, this year, in a town of 120,000. The P-TA went out and worked so hard in the month of March that we have had just two traffic deaths since then. We can now say that we have had a 66-2/3 reduction in traffic deaths.

We had one death on April 1st, right after the P-TA finished "Operation Safety" for March, and we have had one death since. A year ago today we had our 18th death in Peoria. We have 6 against 18, so "Operation Safety" has actually paid off.

We decided that if we were going to really interest people we would have to sit down with them and read it together, and if they didn't like some of it, toss it out and do something else, but use it as an inspiration.

Lots of times these people on the local level have better ideas than we do, but if this is a means of inspiration, it is worth something. Frequently these kits have not been used as they have been presented, but the people went off in their own direction and had a much better program.

In the month of August the motor carriers took on "Courtesy and Defensive Driving." It so happened they were fortunate enough to have the 1948 Illinois Truck Safety Rodeo to toss in there with it, and they really advertised that thing all the way through the month.

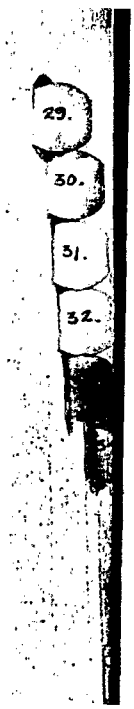
We reached the Central Motor Freight Association in Chicago, which is purely a public relations agency, designed to promote safety throughout the states. We got their driver testing laboratory, with all these gadgets showing reaction time, visual acuity, range of vision, steadiness of nerve, and that sort of thing. We had that thing in Peoria for that whole month.

I don't know how many people went through that, but it did a lot of good, because it focused attention on drivers' licensing, and, in turn, the need for better equipment and better methods by our drivers' license department.

I would like to point out that Illinois does not have a state safety council. The ideas come from the national to us, or we get them through Tom Burke's news letter.

To offset that I reached up from the local level to some of the state organizations and asked them what they could do for us. I called upon Mrs. Frank Dowd to write the P-TA a letter to get them to take March. They were interested, and I put on the pressure by reaching up to the state organization and asking them to practically tell the P-TA to take on the first month of "Operation Safety" in Peoria. Their success is what really brought on the rest of them, through their sense of competition. Every organization was trying to outdo the others.

The Legion not only took on "Operation Safety" in April of this year, but they have been most helpful in giving us their Legion hall every two months, when we call together all the professional drivers in Peoria —not only those in our fleet safety program and contest but all the others who



will come. We usually have a crowd of 400 or so. We have the management, the fleet operators, as well as the drivers, sit down with these men. We give them a minimum of safety in a doggone good time, with everything short of a leg show. We show them movies, we have "community sings," and coffee and doughnuts afterward.

Each month we call upon the sponsors of "Operation Safety" to supply the panel or the jury for the traffic inquests, the traffic fatalities. We believe that if those people go down to the morgue and witness the bodies and then go and hear of the consequences of that traffic accident, they will go back and talk to their families about it, talk to their friends, and since they are a part of the "Operation Safety" sponsors, they usually carry the load. One of them usually becomes a chairman or something like that.

It really works, because those people stop me on the street long after they have had "Operation Safety" for a month, and talk about these things; they want to do something.

Yesterday Mr. Clarke from the Texas Safety Association spoke of an aroused public. I truly agree with you, Kaye, that this is about the extent of what we can do, to develop an interested and aroused public.

There are a lot of ways of doing that. We called upon a junior high school for 40 students to be stationed around the various intersections downtown to count the unsafe acts and the violations on the part of pedestrians. In one half hour we had—with 25 per cent tossed out for error—more than 7,000 unsafe acts and violations on the part of pedestrians in Peoria.

We really don't have a pedestrian protection and control plan down there, but that is a forerunner to it. Those youngsters went back to school and, using their own little house organ, they really went to town. They wrote letters and mimeographed them to the city council. They wanted something done about pedestrian safety in Peoria. They sent copies to the newspapers and to the radio stations, and the aldermen of our council were on the spot for a while until the thing sort of died out.

I believe you know that the National Association of Casualty and Surety Companies has a booklet now called "Safety is Good Business." If you do not know that, I suggest you get in touch with your local agents and get a copy of it and read it. It's very good. They have a parallel program that you can use, and the agents have an economic reason for getting behind you.

Our Association of Insurance Agents in Peoria was able to get two competent traffic engineers from New York to come to Peoria and produce a very fine traffic survey. It started out to be merely an administrative study, but it is now a bible on which we are operating.

I am a member of our traffic commission, which is an official body in the city hall. By ordinance, two members of the Association of Commerce and one member of the Jaycees are on that commission. I was able to come right in and say, "All we're doing in the traffic commission is studying the complaints from your constituents. Now we've got a bible here. Let's study it and let's use it." And I began to make some inroads on the thing.

About the first thing we do now when we meet is take this thing down and start to work on it. The next thing I have to do is to get them to meet oftener than once a month, because by the time they get back the next month, they have forgotten anything they had planned to do.

The mayor and the captain of traffic and the chief of police are very interested. It's the first time that anyone ever came over from the Association of Commerce, and that's how the safety council has been run in Peoria for a long time now, and tried to talk to them about their problems. Before they always remained behind their desks, and the Association of Commerce either sent letters or called over and created a general dissension.

Our Business and Professional Women's Club has been very helpful. They did not take a month of traffic safety, but they did hold a traffic safety clinic, and we had a debating team from Bradley University come down. They had about 300 women there, and I know that must have done some good. These women have also given us very valuable clerical help at various times when we needed to get out a direct mail campaign of some quantity.



The industrial nurses' section has started something.

The police have cooperated to the extent that we get reports on all traffic accidents. We break them down and send them back to the industry where the man involved in the accident was employed. We are going to do the same thing with our Peoria Council of School Clubs—take and plot all of the traffic accidents by locations where these people are domiciled, in the various school areas. Then we will publish a standing, and one school area—one P-TA or mothers' club—will compete against another, on a percentage basis. We hope that this will create intense interest.

We have our motorcycle club in this program, and they are interested. I went out to talk to them. They had 35 there that night. Instead of finding a bunch of hoodlums, I found the managers of departments of industry, or very valuable employees of certain business. All 35 of them wanted to talk about what they could do for the traffic safety in Peoria.

They decided one of the most important things they could do would be to conduct a bicycle safety rodeo, where the youngsters have to go nine months without a traffic accident or violation, where they have to prove their knowledge of traffic laws by a simple written examination. We'll interview them for attitude and interest and appearance, and then we're going to use merely the skill and performance test that you all know about and run them through this miniature rodeo.

MR. JOHN W. STOVER: Our town has a population of around 17,000, and it joins another city in Tennessee of the same name, with approximately the same population. There is no geographical division between the two towns. The state line runs down the center of the main street.

"Operation Safety" is being carried on presently—and for over a year now—by myself. I have not the determination, I guess, that the other speaker had, in seeing that it is carried through successfully.

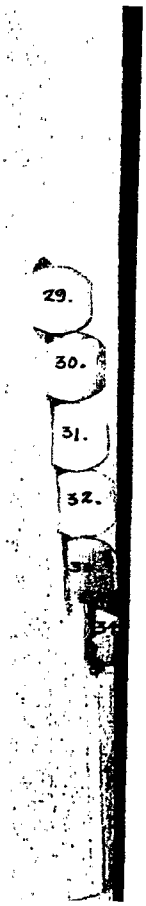
So far as I know, the only literature we got from the national organization was one reworked copy of "Operation Safety." It was very well done. It came right about the time of the convention we had, and a political issue involved in the organization was up. I worked over the material that the state had sent in, deleted nothing and requested that this be mimeographed and sent out, or else published in the state paper. It failed to make that, so in Virginia we had no "Operation Safety" sponsored by the many local posts. We did carry on a little bit in town.

We have been conducting radio talks, starting back in 1946. We started out with 15 minute talks. After beating our heads out with that for about five months, twice a week, we realized that it was too much effort. We had a morning spot, 10:15 in the morning, and I don't think we ever had a comment or heard anything about it.

At present, and for some months, we have had one of the radio stations sponsor a five-minute program every Sunday afternoon. We're getting more comments on that. They have one man assigned to it. We reworked the scripts from "Operation Safety" and tried to pull in as many guest participants as we could. As was mentioned earlier, it does take some work. We like to have a practice session of it before it does go on the air.

We have a Governor's Highway Safety Committee in Virginia which has been operating about a year now, I believe. They organized a council in Bristol in the early part of this year. They had a preliminary meeting, and several days later an organizational meeting was held, but about eight months have passed now and there has been no other session of this council. Of course, as was mentioned, these councils do die pretty quickly. I think it should be the responsibility of some state organization to see that the local councils are revitalized periodically.

I know that during the past years most police chiefs have had personnel problems. We have had to get rid of a lot of men, and we have had to train more men, which doesn't leave us too much time for other things. This is something that I think the state level could do, in going to the communities and seeing that things are functioning well, as they are doing in Connecticut and, I know, in other states. I know that there are still other states, as in Virginia, where the job is not being done. I think that on the state level, too, they might possibly send out a supplement to this material. For instance, on the February program—know and obey traffic laws. There are certain things that are put out



in this folder that would not fit, say, in Virginia, and I imagine that is true in other states. Those are minor things, but it would be nice to have that screened over on the state level.

COLONEL LYNCH: I would like to make this comment. You said that you had the mayor. We did, too. I think that's a good way to start "Operation Safety"—to have the mayor call a conference of these people you think might handle the thing.

Now the American Legion has handled this several times. I will say this, that in the Legion we made a terrific mistake. We gave the Legion the month of September, and that's the time when they have their elections; the old safety chairman is going out and the new one hasn't been appointed, with the result that they just can't function.

We gave the Rotary Club the same month when they have their elections, so we couldn't get them to work. We couldn't have studied it out and made so many nice mistakes as we did. So we have to change the Legion over to some month where the new safety chairman will have an opportunity to work several months in planning it.

I will give you some suggestions as to what we have found. After you set this up, make a committee out of your 12 or 15 representatives—in case you have more than one organization in one month. For instance, in February we have the Insurance Agents Association and the Federated Women's Clubs both in that month, each of them dividing up the work.

But have your meeting of this committee once a month, and at that meeting let the organization that has completed the previous month make a report of what they did, and then have the committees that are going to have the next two months make a report on what they are planning. That develops some competition.

Cheney, here, as I said, with his Boy Scouts, comes and listens for months about what the Junior Advertising Club or some other organization has done, and he wants to do better than they did. Each month it seems like they get better, because they are trying to outdo the one that had the previous month. In that way you keep it alive.

We have a steering committee made up of four people, from the Advertising Club of Los Angeles, the Hollywood advertising club, the police department and the safety council. That is the executive or steering committee. You have that little group to get together and plan your meetings, and so forth. But we have this big meeting once a month, and if you do the same, you'll find you can shame these people into doing these things. If they have agreed to do it, they just have to do it.

MR. LEVI M. HALL [Minneapolis Safety Council]: There are many counties in Minnesota that probably don't have a town of a thousand in them. They are very large counties, some of them. Most of your safety councils are organized in towns or cities of 10,000 or over, and your field men in your state agencies can probably only total two or three for the state. How are you going to reach these people in these counties where they don't have any town big enough to support a safety council?

COLONEL LYNCH: I think the answer to that is that where the city is only a thousand, you sometimes do have quite a population around it.

As I see it, the advantage of this is that first the press and the radio go into that town from the cities, and you get the story in that. Now they do have a local paper, usually, and of course that can be used.

The beauty of this is that you don't have to have a safety council to run it. You can get 12 people—and certainly they have 12 organizations there—who will say that they will do it. Now they can carry on with this outline in that local community by having safety talks and—before the meetings in the town—by getting something into the weekly newspaper. There are all sorts of activities that even a city of a thousand can handle, and, as I say, Jackson has done that in California. They have got some insurance agents in a town of a thousand and they're the ones who really make it click.

QUESTION: How many people here have had a traffic safety conference in their city, in line with the recommendation of the President's Conference, at the city level or state?

COLONEL LYNCH: How many have done that? I see there are quite a few. That thing did not go through in accordance with the President's Conference recommendations as expected, following the Governors' Conference.

QUESTION: You talked about uniformity before, and I didn't quite get your point. What is the uniformity of theme or uniformity of technique? You said everybody should be doing the same thing.

COLONEL LYNCH: You take a lot of radio that originates out there—it used to be that you would go to the radio station and try to get some safety added to Jack Benny's radio program, for instance. They'd say, "Well, are they doing this every place in the United States?" See? You say, "No," and they say, "No soap."

Now you can go to them and say they are doing it all over the United States. Now if they say, "Look out when it's dark out," over Edgar Bergen's program, it registers in many communities. The Associated Press, for example, will carry wire stories about "Operation Safety" if it is something that is understood in the home town.

MR. STOVER: I notice that Kiwanis International has adopted a safety program, too. That might be able to reach down into the smaller communities.

CHAIRMAN SMITH: I'm a little afraid that unless we get the idea of "Operation Safety" quite clearly, you may think in a small community that because you can't use the whole thing, you can't use any of it. The beauty of the program, as I see it, is that it is so adaptable.

If you don't use anything more than the monthly leaflet—use it in your schools, use it as a give-away; there are all sorts of ways you can use that leaflet. If you can't use anything more than the poster, use that. Or if you can't use anything more than the radio script in one month, use that.

But don't neglect the kit or its various parts, just because you can't use it all in a small community. It's very adaptable.

MR. KAYE: I don't believe it makes any difference as to the size of the community in which you operate. There are certain organizations that have a paper group called their "accident prevention committee." We have found that few of those committees are doing anything. They have not had the initiative to get up off their seats or wherever they are to find out



programs that are available to them, and you will find, as we have found, that where we were able to go in with a specific program—not beating around the bush and saying, "You have a committee, we think you should be doing something," but walking in to the chairman of their committee or to the secretary of the organization and saying, "Are you familiar with this program? Is your committee using this particular program or any part of it?"—we can get things done.

Perhaps the man will say, "Well, no; what is it?" Then you have the most wonderful opportunity in the world to sit down and say, "Here it is. Here is your planning guide. You don't have to use all of it. Here are posters, here is the radio script, the newspaper advertising."

They can take any part of it and adapt it to any part of their program, or they can take the whole program. It's a wonderful opportunity to get some of these paper organizations or paper accident prevention committees into a program that is really worth while.

QUESTION: Couldn't the county highway departments be used as a medium?

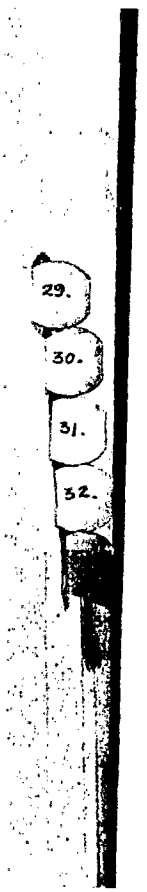
COLONEL LYNCH: In our state "Doc" Huggins has his field men with the highway patrol. I think there is a way, but it would probably be different in each state.

The National Committee for Traffic Safety has adopted "Operation Safety" as a project. Take the list of national organizations and check over the ones that you have in your town, and if their representative doesn't want to come in, you can go right back to Paul Blaisdell and tell him, "I wish you'd give us some help with this particular organization." Paul then will go right in to the head of that organization about it. There are 86 organizations in the committee.

I think a lot of them are overlooking the Boy Scouts. Cheney told me just before I left Los Angeles that the national headquarters of the Boy Scouts is considering taking November for the entire United States on pedestrian safety.

MR. CHENEY: The Los Angeles Executive Council; not the National Executive Council.

COLONEL LYNCH: The man who was executive at Los Angeles is now the national executive, and he saw the public



relations job it did for the Boy Scouts in their work there. It has been a part of their program, but they have so many other things that safety didn't get the emphasis it should. He said it was just a natural for the Boy Scouts, because they can take it, do it, forget it until next year.

MR. HAL KENT [Racine County Safety Council]: We have a very active sheriffs' association in the state. It's at the state level, of course. They are groping very seriously for some method of applying "Operation Safety" through their statewide publication and other facilities for doing a job through the sheriffs' departments in counties outside of incorporated villages and cities. I wonder if anyone here has had any experience with just that sort of thing.

COLONEL LYNCH: We have the Peace Officers Association in Los Angeles County.

MR. EDLUND: The Wisconsin Motor Vehicle Department is cooperating with the Sheriffs' Association. It has furnished articles for the Wisconsin Sheriffs' Magazine, and has been buying some of these things in "Operation Safety" each month.

I have samples here that I can show. We submit releases patterned after the "Operation Safety" releases. They are sent to every sheriff, to every county highway chief in Wisconsin. Those are regularly published. We do the same for the chiefs of police of every city, regardless of the size of the community. That is why the Motor Vehicle Department has not pressed every city—especially the smaller cities—to adopt the "Operation Safety" kit for its community.

We are supplying the same information in as great quantities as we feel they can take. In the larger cities we are giving them radio plus, in the smaller ones only local newspaper stuff.

MR. HUGGINS: Industry is interested in the seasonal and objective type of advertising. For instance, there was the recent General Tire Company's 8,000 posting job all over the country, one of the largest in history, I understand, with $200,000 expended, all given to the idea of "Give the kids a brake."

MR. M. R. DARLINGTON, JR. [Managing Director, Inter-Industry Highway Safety Committee, Washington, D. C.]: Most of you, in some cases, are looking for organizations to sponsor these programs. I would like to urge you to make full use of the automobile and tire dealers' organizations.

I just finished a five-day meeting in Indiana in which we were getting ready for the December program, and through the cooperation of the Indiana Traffic Safety Commission, 1,500 copies of the December program are going to be reproduced and sent down to every level. In other words, every dealer in the state of Indiana had this program, and they are going to pick it up.

Automobile and tire dealers make extensive use of newspaper and radio advertising. They hand out a lot of leaflets and other pieces of advertising. They have buildings in which they can put up posters. I urge you, as council managers and others in safety activities, to make use of these people.

During the month of May, our committee, in cooperation with the Junior Chamber of Commerce, is going to co-sponsor the May program, nation-wide. Every month we are calling the attention of our state committees to the "Operation Safety" program, and stressing those items we feel will be especially helpful to them. .

We are sending out December kits to all of our state committees throughout the country, this next week.

COLONEL LYNCH: Speaking of billboards, here is Mr. Eves, the man who produced that General Tire copy, of the Mass Marketing Institute, and they are producing six 24-sheet posters a year, and these six posters are on the theme of "Operation Safety." They can be bought from the Mass Marketing Institute, for—How much is the price now?

MR. HAROLD L. EVES [Mass Marketing Institute]: Four dollars. Now if you have a committee that has $4 and wants to put up one great big 24-sheet poster, you can write in and you can buy it, and you can get your billboard people to put it up, with "Bristol Kiwanis Club" on it as the sponsor of that poster. They'll feel they have done something, and you'll have a safety poster up for two months.

If you are not now running or have a campaign in cooperation with the outdoor operator in your town, if you will get in touch with him, he will see that you get the posting. If you do not know him, write to me and I'll send you the name of the operator, and I'll also write the operator to get in touch with you.

QUESTION: What is "the operator"?

MR. EVES: By "operator" I mean the outdoor advertising plant operator. If you do get in touch with him, the chances are you can work out a program with him in which you may not have to buy the posters.

The point I'm making is that during the period from now until next spring there is some space open in outdoor advertising. During this past summer it was just all sold out. What next summer will be, no one knows, but there is space coming open now, and the operator is being encouraged by his state and local associations to make boards available to the safety movement in cooperation with different groups.



An example of that is in Wisconsin, where it is now being worked out completely. They took a hundred panels in Wisconsin. The Outdoor Association of Wisconsin turned those over to the Motor Vehicle Department, with the paper, imprint and space, on this basis: "We'll put the name of any organization selected by the Motor Vehicle Department of Wisconsin on these panels, with a commercial evaluation of $5,000." They are not paying that, but that's what that amount of space is worth. They have set that many panels aside, providing that the organization works out a program with the Motor Vehicle Department of Wisconsin to conduct an "Operation Safety" activity in as many of its local units as possible.

In other words, the principle is to use one organization to inspire or wedge another organization, and thereby pyramid the activity, and I think that same thing is very practical, locally.

## Are We Meeting the Challenge?

By MAJOR GENERAL PHILIP B. FLEMING
Administrator of U. S. Federal Works Agency; General Chairman, the President's Highway Safety Conference

At the closing session of the President's first Highway Safety Conference Paul G. Hoffman set a goal and issued a challenge. His words are worth repeating:

"If we all work together, in three years' time we can bring the traffic fatality rate down from 12 to 6, and that would mean an annual saving of 19,000 lives, 650,000 injuries and well over $1,000,000,000 in annual loss from property damage."

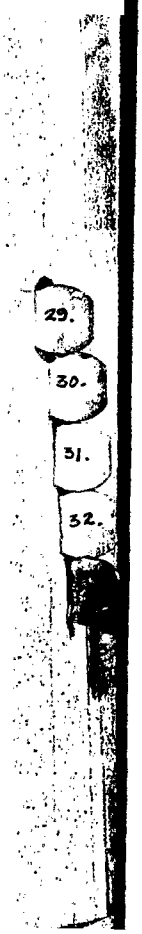
A year later, when the traffic fatality rate stood at 9.8 per 100,000,000 vehicle-miles, Paul Hoffman could report that we had gone more than one-third of the distance toward our goal.

Are we meeting the challenge today? The answer is no. Perhaps I should qualify that just a little bit by saying that we bid fair to almost reach the goal. For the year 1947 we brought the traffic fatality rate down to 8.6. We got it still further in the first quarter of 1948 and the latest figures available indicate a rate below 7 for the first 6 months of this year. Yes, we are close to the goal.

But we should remember that with the added hazards which winter driving brings, our goal may even recede in the months ahead, unless we make a more determined and widespread effort.

Does this mean then that Paul Hoffman was too sanguine, that we did not have the right kind of a program? Again the answer is no. Our partial failure is due entirely to the fact that the Action Program has not been given wide enough application. Far too many states and communities have slighted or ignored crucial parts of this life-saving program.

When I was asked to address the traffic section of this 36th National Safety Congress I decided to review some of the previous sessions—those which dealt with the Action Program. That bit of research was very reassuring. For among other things



I looked over the statements of officials who told how their cities or states had "won" awards in traffic safety contests. And what do you think I found? In every instance I discovered that the campaigns and methods which brought safety awards were patterned after the Action Program. And throughout these recitals the vital word "cooperation" rang like a clarion call.

Yes, that was a most heartening and stimulating bit of research. The moral is obvious—the Action Program has proved itself. Last year 9 states got their death rate per 100,000,000 vehicle-miles below 7, while in 7 states the rate was 11 and over. That range marks the tragic difference between real action and degrees of inaction.

Not long ago the President's Highway Safety Conference issued a book that I can recommend most highly. It is called an "Inventory and Guide for Action," and it is well named. You are going to hear much more about this inventory during the panel discussion. But I want to put it in evidence right now because this careful survey of today's progress and tomorrow's needs shows where and why our steps are faltering.

Last year pedestrian fatalities, for example, dropped 15 per cent in number below 1946—but deaths in two-vehicle collisions were up to 6 per cent. An 18 per cent decrease in urban deaths must be contrasted with a climb of 4 per cent in rural deaths.

Last year, despite increased traffic, the nation showed about a 3 per cent decrease in the number of motor vehicle deaths. A large majority of the states reported fewer fatalities than in 1946, but 16 states reported an increase.

In other words, the declining death rate is not uniform. Some states and cities are lagging far behind. Their citizens are carrying an extra and needless burden of death, injury and property losses. That is the bitter price of inaction.

We have made important gains since the President's first Highway Safety Conference, and I intend to mention some of them. I should like to stress our shortcomings rather than our accomplishments.

In the field of laws and ordinances, for example, where uniformity is so essential, it was found that 16 states strengthened their driver license laws last year, and today only one state is without such legislation. On the other hand, 18 of our states still lack the basic certificate of title laws recommended by the Uniform Vehicle Code, and 10 have no safety responsibility statutes.

And when it comes to rules of the road, I hesitate even to mention the word uniformity. In general, the picture is one of accident-breeding confusion. And even in those states—about 20 in number—which approach the recommendations of the Uniform Vehicle Code there are a good many major departures from sound practice, including deviations in the right-of-way rules. Day in and day out even careful drivers are endangered by these "jurisdictional" hangovers from the horse and buggy days.

Right here I want to remind you that the road to uniformity can be reached most easily through wider use of the Model Traffic Ordinance and The Uniform Vehicle Code. The former provides our cities with a basis for sound municipal traffic regulation. As you all know, a comparative study of existing city laws with this standard is essential for uniformity. This is equally true of the Uniform Vehicle Code.

Much the same can be said about the lack of uniformity in street and highway warnings and directional signs. It is not uncommon to find wide and bewildering variations between the signs used in towns and counties within a single state.

Both the states and the communities are much nearer uniformity in the reporting, tabulation, and use of accident reports. But even with these gains there still are serious gaps—reporting of accidents is incomplete, especially among the states, and processing of these records leaves much to be desired. Often the responsibility for this fact-finding function is divided—that was true of 13 states in 1947.

Thus it is still correct to say that one-third of our states do not get enough reports to enable authorities to draw up and direct a sound and comprehensive accident prevention program. With the best will in the world officials in these states are going to find themselves handicapped in the fight for traffic safety.

Very significant gains are recorded by states and cities in high-school driver training, teacher education, school transportation and other educational phases of the Action Program. These are cheering signs on the road to highway safety but they do not indicate that the goal has been reached—not when less than 15 per cent of the eligible boys and girls are receiving high-school driver training.

Last week I had occasion to address the Annual Conference of the International Association of Police Chiefs. Those of you who were present will recall that traffic law enforcement in 1947 showed a familiar pattern, blended of strength and weakness.

The states especially made substantial additions to their police personnel—38 added more men, and 34 states increased the force assigned to traffic. Yet even after these gains there are only 13 states which have 75 or more traffic officers per 1,000,000,000 rural vehicle miles—the other 38 states fall below the standard recommended by the committee on enforcement.

As for the cities, despite increased personnel, ratios in all groups, only those over 500,000 population managed to get 30 per cent of their number above the personnel strength recommendations of the President's Conference—two police officers per 1,000 population.

There is a pronounced deficit in traffic training, and this lack is more pronounced in the smaller cities—all cities below 250,000 population need more stress on traffic subjects in their in-service training program.

Last year 42 states could report increases in accident investigation, but there is a notable gap when it comes to investigating rural traffic deaths—few states are making adequate check-ups.

Even if Chicago were not host to this National Safety Congress, I would want to mention the fact that this great city began in 1947 a complete overhauling of its traffic safety activities. This far-reaching program will take more than a year to put into operation. It embraces the work of the police, laws, and courts, as well as traffic engineering and safety education.

The very magnitude of traffic volumes in this country, with more than 44,000,000 persons holding driver's licenses, implies a big job for our traffic courts. In the year 1947 it is estimated that more than 9,900,000 urban traffic violations were processed! Complete data for rural areas would probably swell the national total to more than 12,000,000.

The impact of such a tremendous load has been felt by motorists, judges and prosecutors alike. More and more we are coming to realize the need for a long-range program to improve the quality of justice administered by the nation's traffic courts. Needless to say, progress in this direction will be reflected in every phase of traffic law enforcement.

Several encouraging steps were taken during the past year. The American Bar Association authorized the granting of awards to the cities reporting the greatest improvement in traffic court practices and procedure. The first of these awards were made in Seattle at the September 1948 meeting of the American Bar Association.

In cities of over 500,000, Washington, D. C., and Milwaukee, Wisconsin, were tied for first. In Group II, cities of 200,000 to 500,000, the top award went to Denver, Colorado. Among cities of 100,000 to 200,000, Sacramento, California, and Tulsa, Oklahoma, shared first place. In Group IV, from 50,000 to 100,000 population, the top award was won by Winston-Salem, North Carolina. Plainfield, New Jersey, led Group V, and Midland, Michigan, was first among cities below 25,000 population.

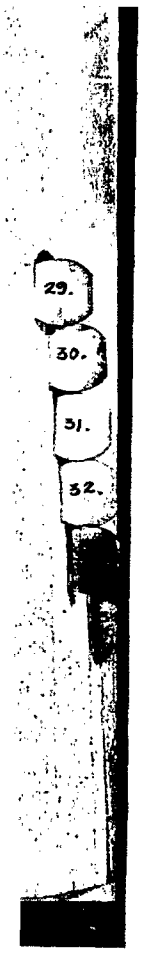
Reports from the states indicate that 18 made an effort to secure improvements in traffic courts through administrative action; 4 states relied on legislation and 2 states resorted to constitutional revisions.

The 544 city reports reveal that a number of improvements are under way in practices, procedure, courtroom facilities and the use of records of prior convictions. There is better operation of traffic violations bureaus, more frequent assignment of prosecutors to traffic cases, wider adoption of special court days for traffic police.

All in all it is plain that most municipal traffic court judges and prosecutors are well aware of the need for improvements, but far too many of them are handicapped by city officials who fail or refuse to make essential funds available.

Undoubtedly pressure from a more alert public would give great impetus to this phase of the Action Program.





I looked over the statements of officials who told how their cities or states had "won" awards in traffic safety contests. And what do you think I found? In every instance I discovered that the campaigns and methods which brought safety awards were patterned after the Action Program. And throughout these recitals the vital word "cooperation" rang like a clarion call.

Yes, that was a most heartening and stimulating bit of research. The moral is obvious—the Action Program has proved itself. Last year 9 states got their death rate per 100,000,000 vehicle-miles below 7, while in 7 states the rate was 11 and over. That range marks the tragic difference between real action and degrees of inaction.

Not long ago the President's [redacted] Safety Conference issued [redacted] recommend most hig[redacted] "Inventory and G[redacted] is well named. [redacted] more about th[redacted] discussion. [redacted] right now [redacted] today's [redacted] shows w[redacted] tering.

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Last [redacted] nation s[redacted] in the nu[redacted] large majo[redacted] fatalities tha[redacted] an increase.

*In other word*[redacted] is not uniform. S[redacted] lagging far behind. Th[redacted] ing an extra and needless [redacted] injury and property losses. That is the bitter price of inaction.

We have made important gains since the President's first Highway Safety Conference, and I intend to mention some of them. I should like to stress our shortcomings rather than our accomplishments.

In the field of laws and ordinances, for example, where uniformity is so essential, it was found that 16 states strengthened their driver license laws last year, and today only one state is without such legislation. On the other hand, 18 of our states still lack the basic certificate of title laws recommended by the Uniform Vehicle Code, and 10 have no safety responsibility statutes.

And when it comes to rules of the road, I hesitate even to mention the word uniformity. In general, the picture is one of accident-breeding confusion. And even in those states—about 20 in number—which approach the recommendations of the Uniform Vehicle Code there are a good many major departures from sound practice, including deviations in the right-of-way rules. Day in and day out even careful drivers are endangered by these "jurisdictional" hangovers from the horse and buggy days.

[redacted]right here I want to remind you that [redacted] to uniformity can be reached most [redacted]h wider use of the Model [redacted]nce and The Uniform Ve[redacted] former provides our cities [redacted] sound municipal traffic [redacted]ll know, a comparative [redacted] laws with this standard [redacted]uniformity. This is [redacted]form Vehicle Code. [redacted]be said about the [redacted]reet and highway [redacted] signs. It is not [redacted] and bewildering [redacted]gns used in towns [redacted]gle state.

[redacted]e communities are [redacted] in the reporting, [redacted]ccident reports. But [redacted] there still are serious [redacted]cidents is incomplete. [redacted]e states, and processing [redacted]leaves much to be desired. [redacted]isibility for this fact-finding [redacted]ivided—that was true of 13 [redacted]1947.

Thus it is still correct to say that one-third of our states do not get enough reports to enable authorities to draw up and direct a sound and comprehensive accident prevention program. With the best will in the world officials in these states are going to find themselves handicapped in the fight for traffic safety.

Very significant gains are recorded by states and cities in high-school driver training, teacher education, school transportation and other educational phases of the Action Program. These are cheering signs on the road to highway safety but they do not indicate that the goal has been reached—not when less than 15 per cent of the eligible boys and girls are receiving high-school driver training.

Last week I had occasion to address the Annual Conference of the International Association of Police Chiefs. Those of you who were present will recall that traffic law enforcement in 1947 showed a familiar pattern, blended of strength and weakness.

The states especially made substantial additions to their police personnel—38 added more men, and 34 states increased the force assigned to traffic. Yet even after these gains there are only 15 states which have 75 or more traffic officers per 1,000,000,000 rural vehicle miles—the other 38 states fall below the standard recommended by the committee on enforcement.

As for the cities, despite increased [redacted] sonnel, ratios in all groups, only thos[redacted] 500,000 population managed to get [redacted] cent of their number above the pe[redacted] strength recommendations of the Pr[redacted] Conference—two police officers pe[redacted] population.

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Undoubtedly pressure from a more alert public would give great impetus to this phase of the Action Program.

Several very promising first steps were taken during the past year. They include: A series of 4 regional traffic court judges and prosecutors conferences designed to reach all parts of the United States; development of "schools" of instruction for justices of the peace, police magistrates, and other judges of rural courts; the formation of a National Conference of Trial Courts of Limited Jurisdiction—composed of representatives from 16 state-wide organizations of justices of the peace, magistrates and trial justices.

The state of Michigan has pioneered in a successful movement toward uniformity in traffic tickets and fines. The uniform traffic ticket developed and used in 5 pilot cities has now been adopted in 30 additional cities. Fourteen of these cities also have reached agreement on a uniform fine schedule for use in the violations bureaus. The system is spreading to cities outside the state of Michigan—it deserves nation-wide acceptance.

Traffic court judges and prosecutors are mainly responsible for the improvements that I have cited. But as in every other phase of highway safety and accident prevention, there is urgent need for increased support from other groups—the organized bar, public officials, civic bodies and all safety-minded segments of the public.

In the field of engineering, a number of states now occupy an advanced position. They recognize the urgency of planning comprehensively for all highway needs, including safety. Authorities in California and Michigan have made especially noteworthy contributions—reports using facts developed through their state highway planning survey organizations and other data available from local civic and official sources. Several national organizations cooperated in the engineering analysis of California's and Michigan's road needs, and striking figures concerning the relation of accidents to highway design and operation were presented.

This partial review of progress and problems under the Action Program, underscores the familiar fact that there is no magic formula, no royal road to highway safety. But by the same token we do know what are the tested ways to accident prevention.

Consider this remarkable piece of evidence. When the year 1947 ended, the national fatality rate was 8.6, but the 31 states having an active coordinating committee of State officials averaged 8.2. The 21 states which had created a state-wide public support organization averaged only 7.7. As the first quarter of 1948 ended, the national rate was 7.7 while the states with official committees averaged 7.3 and the 21 states having a public support program were down to 6.6.

Though it is more difficult to measure progress in the towns and cities, we now have for the first time facts and figures which show the correlation between the fatality records and the existence of an active local public-support organization. In 5 out of 6 population groups the fatality rate per 100,000 was lower for cities which had active, organized public support of highway safety.

Public support has grown fastest in the larger cities. It is rather disconcerting to discover that among the municipalities ranging from 10,000 to 50,000 in population less than 10 per cent have a creditable support organization. Yet in these smaller cities active public support is clearly reflected in a lower fatality rate. In group VI, for example, with populations from 10,000 to 25,000, the rate for cities with active public support was 7.1 against 12.2 in cities lacking such an organization.

Necessarily I have been talking in rather general terms—terms which do not indicate the wealth of detailed information that lies back of "average" figures dealing with traffic safety. Actually, however, the Inventory is built up from state reports, city records and case histories that show clearly what needs to be done and how it should be done.

These sources give direction and purpose to the Action Program. Though 622 cities have reported on their safety activities, we need much broader participation. Our inventory is far from complete, but the value of such material has been established beyond question—the present Inventory is proof enough. The case for broader participation and application is equally clear.

In the panel discussion which follows you will come to grips with this problem. I am sure that your deliberations will bring our goal much nearer.



# The Annual Inventory of Traffic Safety Activities—What It Is—How It Works—What It Does

**(A Panel Discussion)**

*Discussion Leader:* J. L. Lingo, Director, Public Safety Institute, Purdue University, Lafayette, Ind.; Chairman, National Traffic Safety Contest Advisory Committee, N.S.C.

*Participants:*

T. N. Boate, Director, Public Safety Division, Association of Casualty & Surety Cos., New York, N. Y.

James P. Economos, Director, Traffic Court Judges & Prosecutors Conferences, American Bar Association, Chicago, Ill.

William Gill, Jr., City Manager, The City of Oklahoma City.

Rudolph F. King, Registrar of Motor Vehicles, Commonwealth of Massachusetts, Boston, Mass.

Thomas H. MacDonald, Commissioner of Public Roads, Federal Works Agency, Washington, D. C.

Arthur W. Magee, Commissioner of Motor Vehicles, Trenton, N. J.

Buxton W. Marsh, Director, Traffic Engineering & Safety Department, American Automobile Association, Washington, D. C.

Lew E. Wallace, Assistant to the President, National Safety Council, Chicago, Ill.

C. Reynolds Weaver, Liaison Officer, President's Highway Safety Conference, Washington, D. C.

CHAIRMAN LINGO: The Action Program developed by the President's Highway Safety Conference of 1946 set up definite standards and recommendations to guide people who are interested in developing traffic safety programs of all types. The standards and the body of knowledge were based on the best thinking of the people in the field at that time.

Now I think we all recognize the fact that the best action program in the world, the best standards in the world, the best body of knowledge or whatever we might want to call them, are certainly not going to reach their full potential if they become a static thing. They are things that have to be constantly developed, changed and adapted to meet changing situations in the field.

We have perhaps reached the point where we might discuss the developments and the establishment of a method of determining what can be done, how it can be done, what places are doing it and so forth. We might discuss the facts and information that is necessary to implement the action program as it was originally set up.

When we have the information and facts about the picture throughout the entire country, it will help us in the traffic safety field to do a better selling job. That is certainly one of the big values of this inventory program.

Most important of all, however, in connection with the program, is using the inventory as a research project in traffic safety today to provide information for the changing of our standards or for the adaptation of our standards.

I am going to very briefly give you the purposes and objectives of the annual inventory of traffic safety activities as outlined in your inventory blanks.

Briefly, the inventory will serve the following objectives, or will strive to serve the following objectives:

It will be the basis for the National Traffic Safety Contest awards to states and cities. You are all familiar with that program and the value that has been derived from the contests conducted by the National Safety Council during past years.

The inventory will also serve as a basis for the American Bar Association's Traffic Court awards. This is a comparatively new development.

Something newer still—the inventory will serve as the basis for the traffic enforcement awards of the International Association of Chiefs of Police. This program of enforcement awards by the International Association of Chiefs of Police was approved at their annual convention, and the

details have not been completely worked out.

The inventory will also provide information for the individual state and city analysis of traffic safety activities prepared by the National Safety Council.

I'm sure that all of you recognize the value that has been and can be achieved through these analyses of your annual reports.

The inventory will provide information for the annual progress report of the President's Highway Safety Conference.

The inventory will also serve as the annual compilation of factual experience which can be used for improving standards of operation and for many other purposes. I like to think that the inventory is perhaps the biggest research and fact-finding job in traffic safety today, and one of the most important.

I am going to begin the discussion by asking a question of Commissioner MacDonald. In your opinion, what is the outstanding contribution that the traffic safety inventory, as outlined, can make to even further progress in developing our highway transportation system?

MR. THOMAS H. MacDONALD: Mr. Lingo, there are two words that are in common use in our daily conversation that I might mention. One is "yardstick" and the other is "milestone." These two words have a little different meaning, although they are both units of measurement. The yardstick is usually thought of as a tool to measure how to get results. We have many yardsticks that are used in research. In fact, sometimes it takes longer to devise a tool to measure what we want to accomplish than it does to actually accomplish the result. That, however, isn't too true in the safety movement.

A milestone, while it also is a unit of measurement, does act as a permanent monument of the distance that we have come.

The important aspects of the inventory are two: It serves as a yardstick to measure the results, and it serves as a milestone to record the progress that we have made.

The inventory, of course, is being compiled each year by devoted representatives who haven't had very much acclaim, but in the two aspects—of the yardstick as a tool to measure and the milestone as a method of establishing the distance that we have come—the inventory certainly does act in a dual capacity, and is our only method of recording the results that we get year by year.

What I am saying is directed principally to those who are the inventory representatives. Sometimes they have been called "contact men," and probably at other times they have been called worse names when the prizes weren't awarded to their cities or states on the basis of their reports. I wish to pay particular tribute to these men for the work they have done in the past.

In the organization of the President's Conference, and particularly in the results that were achieved, there were a number of men who devoted their time to doing the actual work in getting the conference in motion with what was at one time described in Washington as "a passion for anonymity." That is, a great many people have never known too much about the men who have actually devoted themselves to putting the President's Safety Conference into motion. Among these were Mr. Bohlen at the last Conference; at the first Conference it was Colonel Yost. Mr. Dunman and Colonel Weaver have served through both. I'm bringing these things in because we have Colonel Weaver on the panel today, and I'm going to pass along this question to him. Colonel Weaver, what is your concept of the utility and importance of these inventories that are made annually, or these reports made by the inventory representatives?

COLONEL C. REYNOLDS WEAVER: In 1946, when the first President's Conference was held—and some 2,000 people were there who developed the Action Program—the members of the Conference agreed and suggested that we should follow up in succeeding years with some sort of progress report to find out how far we were going in the states and communities in applying the Action Program.

As you know, in 1947 an attempt was made to do that, and I think it was a fairly successful attempt. At that time a separate report form was developed to furnish material for use as a yardstick. It was sent out to the states, and they did a very fine job.



The next year we wanted to know how we could put this on a permanent basis, as the people at the '47 progress report meeting agreed we should continue this sort of progress report.

In looking around, it was seen that there were certain annual contests going on; the state and city officials were supplying a wealth of information. So we asked ourselves how that information could be used. In discussing it with the staff people, with the various national organizations and with the President's Conference, a plan was developed. One of the activities that is now being used is what was formerly known as the National Traffic Safety Contests. You know this year that it has been called the "Annual Inventory of Traffic Safety Activities."

Professor Lingo has enumerated the various uses to which this material will be put in this and succeeding years. Also, very important information and material has come from the American Automobile Association's Pedestrian Protection Contest.

From all of this we did come forward with a report this year called "Inventory and Guide for Action," a publication of the President's Conference. It is a fine job of stock-taking; it is a yardstick, a report of progress. Now we can say, "Where do we go from here?" We are able to do this because of the material provided by these national organizations that are working with the state and city officials.

I would say that we hope to continue on the same basis and do a better job as we go along. The important thing is to work with the states and communities in securing more factual data, and then make the best possible use of what is secured.

As you say, Mr. MacDonald, it is entirely up to the representatives in states and communities, and it rests upon their shoulders to do the job. All we can do is to assimilate these data, analyze and publish them.

MR. LINGO: Colonel Weaver has mentioned the fact that there are a number of other activities in connection with this annual report than just the inventory that we have talked about, and I'm going to ask Mr. Burton Marsh, who is in charge of the National Pedestrian Protection Contest, to tell us something about the objectives and purposes of that activity in connection with this entire program.

MR. BURTON W. MARSH: I want to talk to you just a few moments about the pedestrian who has been "the forgotten man" in traffic but today is being remembered again.

It is true, as you know, that the pedestrian is the largest single group in the National Safety Council's classification. You know the figures, and I would be insulting you to remind you that one-third of the people killed are pedestrians, but I might not be insulting you when I tell you that in cities this figure runs up as high as 8 out of 10 persons killed afoot.

It was because this situation impressed us as it impressed many others that about 1936 the American Automobile Association decided that it would endeavor to do something effective on this job.

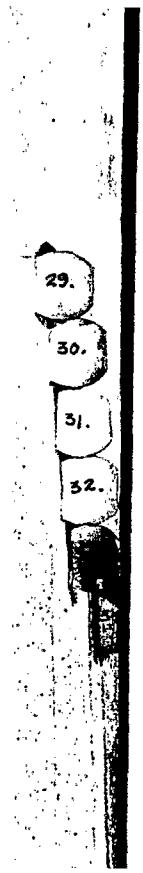
The first step was a national survey, but we found it most difficult to secure the most basic information to make it possible to get out a manual or guidebook. However, we finally did get one out called "Pedestrian Protection," a rather extensive guide on the subject.

We simply couldn't find the information, so we asked ourselves, "If this is going to get anywhere, how in the world is it going to be possible to get more of this information and to get communities and groups that are interested, so that the job will be done?"

We went over various devices that might aid us in securing information and finally decided that the best kind of an idea was a stimulus to be provided by competition. This competition—which has since been worked out with the co-operation of the National Safety Council—devotes itself exclusively to the pedestrian. It endeavors to provide a basis for encouraging officials and organizations of various types to give more attention to the man afoot.

It is now in its tenth or eleventh year, and we think that it has played a useful part.

I would like to preface the figures I am about to give, so that no one will misunderstand me. I do not want to imply that this contest accomplished the following things all by itself. That it had some part, I truly believe; I hope you will, too. In any case,



ie credit goes to the officials, principally, ho, as Mr. MacDonald well said, don't et enough credit for the hard work they e in making these things possible.

Nevertheless, there has been a 34 per ent reduction in the annual number of edestrian deaths during the past ten years. Ten years ago the pedestrian deaths made up 40 per cent of all traffic deaths. Last ear this figure was down to 32 per cent, with 1,500 fewer deaths than in 1946. Now I'd like to point out that this 1,500 fewer represented a 15 per cent reduction from the year before, and that reduction was what brought our total down below what it was the previous year.

The contest is divided among states and cities. The cities are divided among sizes into various size classes. The states are also divided according to a formula. Multiple correlation produces it, and I believe honestly it is a very equitable way of balancing between the states.

This contest started with 256 cities and 31 states. That was the first year. Last year, 1947, there were all the states and 1,482 cities—1,500, virtually, or three-quarters of all cities above 5,000 population participating. Naturally, we want to see that figure larger this year.

At the end of the year, the officials involved submit reports, and these are judged by a group of eminent judges. Chief MacDonald has been chairman for a number of years. On the basis of this judging, the decisions have been reached and judged, partly on program and partly on record, and the awards have been made to the winning cities and the winning states. These awards are plaques, familiar to many of you.

In addition to its use for stimulating greater activity, the contest has been used to help in the work of the President's Highway Safety Conference. We hope that we may continue to be of service in that respect, and that the contest will be able to help in even more activities than they have in the past.

There is a third part which I should like to mention. For some years we have offered a sketchy appraisal of where a city stood in comparison to the best cities in its size class. We used to call it a profile graph, but nobody understood it. We have given that up and gone to a better form, which is a statement form of analysis of that city's record in comparison with other cities, with recommendations on things which ought to be done by that city to bring its record up, based not upon our judgment but upon what the top ranking cities or states in that size class are doing. We think this is useful information, and we are finding that it is very popular.

I'd like to close with this one point, that in this whole area of the pedestrian, there is a tremendous amount of work yet to be done. We hope in the years ahead that our work in this particular activity may be of some service in helping to advance further the interests of who was once "the forgotten man" but who I think is now being remembered.

MR. LINGO: As you can see, the purposes and objectives of this pedestrian program and its importance are being appreciated.

Colonel Weaver also mentioned another very important part in this whole project in connection with the National High School Driver Education Award program, which is conducted by the Association of Casualty and Insurance Companies. I'm going to ask Mr. Tom Boate if he will tell us a little something about President's Conference, its purposes and objectives.

MR. T. N. BOATE: For a great many years the Association of Casualty and Surety Companies under the title of the National Conservation Bureau has been engaged in assisting state officials, responsible for street and highway safety, in the creation, the administration and the support of an accident prevention program designed to bring to the high school youth of this nation a sound and well rounded course in safe driving.

With that background of experience we have had first-hand information on all the hard work that has been put in by state officials in promoting this very important accident prevention program in the face of many obstacles and many heartbreaking disappointments. Because of that knowledge, the Association of Casualty and Surety Companies last year came to the conclusion that somewhere in this picture there was room for an award, some sort of an award that would recognize the work of the state administrators responsible for highway safety. The Association had in



mind the education department, the motor vehicle commissioner, the police and on down through to your high school principals, administrators, and, probably more important than all, the children who are recognizing the need to participate in this course of education in order to prepare themselves to drive automobiles safely. Thus the high school driver education award program was created.

In November of last year, we wrote to the 48 governors of the states and requested that they participate in the program by appointing a co-ordinator with whom we could work out the details. Within ten days we had replies from 41 of our governors, enthusiastically endorsing the program, and naming a co-ordinator. We think that certainly confirms our judgment. Moreover, I think it is significant that our top state executives are keenly interested in promoting accident prevention on our streets and highways, and particularly so through the medium of education.

The program is a simple one. We have a co-ordinator in each state. He is provided with forms, questionnaires that he sends to the high school principals. The questionnaire contains five very simple questions, asking the principal of the high school, (1) whether or not he has had a program in driver education; (2) whether or not such a program is in the classroom work; (3) whether it includes both classroom and behind-the-wheel training; (4) how many eligible students he has in his school; and, (5) how many of these eligible students are taking the course.

We provide the co-ordinator with a single form, and we ask him to compile the information and submit it to us by the 1st of May. This information is then accumulated and presented to our board of 12 judges.

The judges are national leaders in the highway safety movement. Chief MacDonald and Ned Dearborn, President of the National Safety Council, are on it.

There are three types of awards. They are in the form of bronze plaques. One award, the Meritorious Award, recognizes 25 per cent of the high schools, and we take in private or parochial with the public high schools having 25 per cent of the eligible students enrolled in a high school driver education course. The next higher award is the Superior Award, which represents 50 per cent achievement in that regard. The final and top award is the Excellency of Achievement Award, which recognizes a high degree of development of this program, together with college level courses carried on to train teachers; the appointment of a state official responsible for the promotion and leadership in developing this program state-wide; and the maintenance of records to determine the actual experience of graduates as against those who do not take this form of training.

During our first year—the 1947-'48 school term—38 states submitted reports, 25 of which were complete.

The number of schools in these 38 states was 19,006. The number of courses in high school driver education in those schools was 3,918. There were 1,643,836 eligible students enrolled in these schools, and of this number there were 238,030 students enrolled in the courses.

Of course, we did accumulate data which was submitted for the progress report of '47 which went into a comparison with the development during the '47 and '48 term as compared with the previous school term.

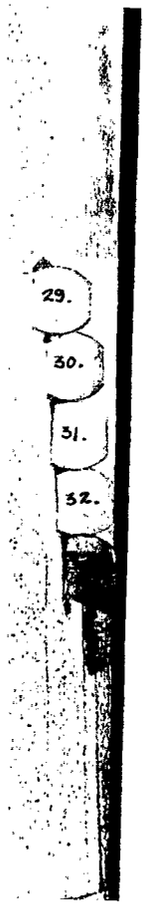
The Board of Judges made awards to nine states—North Dakota, Wisconsin, Delaware, Arizona, Illinois, Massachusetts, New Jersey, Virginia and West Virginia.

In passing, I would like to say that we have been greatly impressed with the high degree of cooperation and enthusiasm that has been indicated on the part of the governors upon receipt of these awards. I had the honor of presenting an award to one governor, who called in his entire cabinet to his office to witness the reception of this award.

In two or three other instances, states have conducted very fine lunches at which the governors have brought members of their cabinets, particularly those responsible for education and highway safety matters, for the reception of these awards.

We think that of the many important benefits accruing from this program, one of the most important is its contribution to the annual inventory of traffic accidents.

MR. LINGO: I mentioned in my summary of the objectives of the annual inventory the fact that the American Bar



Association has an awards program, and that this is also being used as a part of the total results, the total summary for the President's Conference report and the annual inventory.

I am going to call on Jim Economos to give us an idea of what that program involves and what its purposes and objectives are.

MR. JAMES P. ECONOMOS: To try to tell you in a few words where the traffic court program fits into the inventory program would be an imposition upon your intelligence, because I think all of you would realize that it would be impossible to have an effective traffic safety program if you had a lousy traffic court to go to with your cases.

If a traffic court, from the standpoint of the administration of justice, is performing an effective job, it is immediately contributing to the accident prevention activities of a community and the state. If every element in accident prevention and traffic safety were operating at a high level of efficiency, except for the traffic court, you would lose all esteem for your program, because of the non-receptiveness of the judge who sits in that court. We are trying to eliminate that by the institution of this contest.

We think we are pioneering in a field which will pay off in dividends to the communities which participate. We think that in setting up the awards, we are doing two things. We are participating in a promotional program to stimulate interest in the administration of justice, which is so near and dear to the heart of every member of the bar, and at the same time we are setting up a machinery which will say to the servants of the public, "This is a job well done."

We are expressing our appreciation through the form of the award to those particular communities which have seen the need for cooperation with the courts by providing them with the physical facilities that they require; by providing them with the proper records, proper clerical staff, proper bailiffs, and adequate salaries for judges and prosecutors, so that they can be full-time rather than part-time. In this way the expense that the community has to expend will receive some bit of recognition from the one organization which is supposed to know something about the administration of justice.

We think the experience we have gained in this first year will result in an improved questionnaire; that it will call attention from year to year to the matters which require further attention, based on the experience of the past years' questionnaires. For instance, to be specific, we discovered this year that violations bureaus, which are supposed to be an arm of the court, a part of the administration of justice, are operated entirely too frequently under the supervision of the city council or the chief of police. This is an invasion of the right of the judiciary to do a job, if that judge wanted to do it in the first place. Unfortunately, the other reason that was permitted to exist was because the judiciary did not do that job.

Through this contest we hope to point out the fact that the operation and administration of a violations bureau is a judicial function, and there will be points given for that. That is a trend. It is one of the things that we learn from the operation of this contest.

The answers to the questions which the future will produce will be taken entirely from the action program, which is, in turn, based on the Warren book on the improvement of traffic courts. If any city wants to know how to improve their courts, and what steps to take, all they have to do is take the inventory and guide for action, look to the previous year's report, and start working and spending the money that is required to do a better job.

In setting up this program and integrating it into the traffic safety activities, we feel that we are, for the first time, giving proper emphasis to the judicial functions involved in the court problem. We are very happy to hear that there is going to be a traffic law enforcement award, because that will make clear to everyone that there are two problems that have to be met squarely by each of the persons responsible for the better job which is required to be done in that particular area.

We are happy to be a part of this program, and I am going to violate a rule that was adopted here and say that it would have been utterly impossible—in fact, almost an insurmountable headache—for us, in the American Bar, to have attempted to do the job last year were it not for the excellent cooperation of Lew Wallace and his staff. I didn't say "National Safety Council"; I said "Lew Wallace." I don't think I completely violated the rule.

We appreciate the help you have given us, and we say that the past is only a prologue of the future. Let's have better traffic courts and let's have 100 per cent cooperation in this award program which is doing so much for everybody.



MR. LINGO: We have heard something about the various organizations and from the organizations that have a part in making up this annual progress report. Next we turn to one of our state administrators and ask him some very practical questions. I'm going to ask Commissioner Arthur Magee to tell us from a state standpoint now, just how he feels the inventory and analysis program—and the annual report through the analysis—can assist the states in doing a more effective job.

MR. ARTHUR W. MAGEE: In my judgment, the inventory program is a distinct contribution, because it is a means to an end.

I have felt for a considerable period of time that there is a possibility of losing sight of objectives when we stick to certain standards. In other words, I feel that in this inventory activity we have got to very carefully safeguard methods and distinguish between objectives and the standards by which the activity is judged.

I want to support that statement by citing an instance or two in the state of New Jersey. One has to do with traffic engineering. In the state of New Jersey, the Traffic Engineer is a part of the motor vehicle department. We cooperate to the fullest extent with the traffic construction engineering in the highway department, but I think that we have been subject to unfair criticism because all traffic engineering does not stem from one source or one state agency.

Another instance has to do with our motor vehicle inspection program. We find out during our activity of inspecting motor vehicles that at least one person in every family has a driver's license. I think now we have a means of determining activity with respect to holders of drivers' licenses, and that there will be some revision and some credit given to the state instead of losing credit and not having an activity in that respect.

Under the New Jersey law, and I think the laws in the respective states have to be taken into consideration, we, in the engineering field, are required and do give service to municipalities with respect to signals and highway markers. Our activity in the engineering field is singularly effective, even though it may not be measured according to the standard as set up in the inventory activity.

I'm simply pointing out that we must guard against the measuring of activities according to a certain standard.

In the field we think more about "Do we get results?" or "Do we reach our objective?" rather than the means of obtaining that objective.

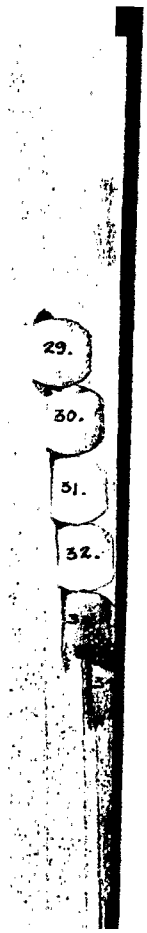
It seems to me that within a period of two or three years, the information furnished by the inventory should give us the answers. However, if we can set up one administrative method which is considered to be the best method, undoubtedly others will adopt that one best method. But if there are conditions prevailing within our states whereby we have to adopt another method, let the yardstick be, "Did you accomplish your objective regardless of your method?" And to do this, as officials from the state and city, we must help, and we will be helping, I think, by following the means of sound questions that will be of benefit to the work in connection with the inventory activities.

MR. LINGO: I think the Commissioner certainly has pointed out a practical, sane lead for the adaptation as we go along, and the thing that I tried to point out in my discussion.

Let's turn from the state picture, momentarily, to the city picture, and ask one of our city participants to tell us something about that phase of the program.

Mr. William Gill, City Manager of Oklahoma City, is going to tell us what benefits he feels a city can get from the annual inventory and the other activities associated with it.

MR. WILLIAM GILL: For a community that is desiring to do a job in traffic safety, there is no greater benefit, in my opinion, than that secured from the annual traffic inventory and the analysis report. That might seem to be a rather broad statement to some city officials, but after using the inventory and receiving the analysis, and



seeing our city become better in the field of traffic safety because we did avail ourselves of the program, I feel it to be true.

I am going to admit that, like a lot of other people who might be termed, shall we say, "laymen traffic experts," that I thought I knew what our community needed to solve our traffic problems. I thought I knew how to reduce the death rate, the accident rate, and how to get better enforcement, better reporting of accidents and so on down the line.

Well, finally, after a lot of "needling" by Dan Hollingsworth, who is director of our safety council, and after periodic visits from Dick Bennett, James Pryde, Reynolds Weaver and Lew Wallace, I admit that I knew nothing about what I was talking or thinking. However, I had enough confidence in these men to believe that they knew of what they were speaking.

I found that, after all, it is a relatively simple procedure. A community, a corporation owned by its citizens, acts like any other corporation operating on a sound business basis. It simply sits down and takes an inventory, not of the goods or the materials on hand but of its traffic safety activities. It handles up that inventory and sends it in to a committee of impartial persons who coldbloodedly take it apart, compare it with other cities, note its achievements, but hard at its deficiencies, and send back a complete and detailed analysis of what you have accomplished and what you haven't accomplished.

The report says to you, "You need a traffic engineer," so we employ one. It says, "You are doing hand tallying of accidents; the cities in the top 30 per cent in your class use a mechanical tabulation," so you buy machines. It says, "Double your enforcement," so you double it. It says, "You have ample parking; make a study to see if angle parking can be eliminated," so you make the study.

You probably think, "What's wrong with this bird sitting up here, who says that the analysis reads thus, and so you just go ahead and do it? What about the citizens? What about the mayor and council?" If a community desires to do a job in traffic safety, there is nothing better, in my opinion, than your annual inventory of traffic activities and its analysis report, because I know of no community wherein the mayor and council, the business men, the chamber of commerce, the Rotary Club, the Lions Club, the P-TA and so on down the line desire or want to kill or injure the citizens or place hazards in the way to prevent the movements of vehicles or make an arrest just for the fun of it. On the other hand, in most communities there is a desire to do something about traffic problems, and with this desire comes the question of what should be done, what will work, or "Who said so?"—"How do you know?"—"Have these things been proved?"

The analysis, in my opinion, gives the city officials and the community the facts and figures necessary to properly answer these questions. It is a criterion of your work as compared to the top 30 per cent of the cities in your same group, but need not necessarily be taken, per se. I say that for a reason.

A lot of you know "Smokey" Hilbert, the Chief of the Police Department of Oklahoma City. He is a great guy. Well, I don't know whether it's safe yet for Lew Wallace or Dick Bennett to come back to Oklahoma City. They told "Smokey" a few things when they were down there, and he just went right through the ceiling, and now he's determined to make Lew Wallace and Dick Bennett eat their words. There is hardly a day goes by but that he doesn't come in the office and say, "Look at this report. See what we have done? Here's what we have been doing, and by the end of the year those birds will eat their words."

The traffic safety program in our community started a few short years ago and was based on the studies that we made of analysis reports of years gone by, coupled with the thinking of the police department, the safety council and citizens' groups, and we had the tried and proven experiences of other communities as evidenced by the analysis report. We commenced our program on that basis, and now we use the inventory and analysis to note our accomplishments with pride, to view our shortcomings with distaste and chagrin, and to pledge that we will make the committee further keep its word by turning our deficiencies into accomplishments, to soundly and factually present arguments to our mayor and council and citizens as to the why's and wherefores of the program.



The inventory and the analysis, together with the follow-up services of the National Safety Council, have been to me important tools in driving Oklahoma City out of the mire of traffic accidents and congestion, and I'm looking forward to using these tools to even a greater degree in the future.

I may be a little bit presumptuous in addressing this final remark to you city officials, and I hope that there are none of you present who are guilty of it, but if your city has not made this report and taken the analysis of the report of your community and opened it up and read it and studied it and lived by it and pledged yourselves to carry it out, in my opinion, you are not fulfilling your job.

CHAIRMAN LINGO: I think you can see now why Oklahoma City won one of the grand awards last year.

One of the things we are going to discuss in this panel is state and city cooperation. You have heard the city's angle, you have heard the state's angle. Now we want you to hear something about the matter of state and city cooperation from Registrar King of Massachusetts.

Registrar King, do you feel that state-city cooperation in connection with the inventory is a worth-while expenditure of time and money by the state? And, secondly, I'd like to ask you what has been the reaction of the city officials to the type of activity that you have pursued so successfully in the commonwealth of Massachusetts.

MR. RUDOLPH KING: It is my firm belief that not only the success of the traffic safety program but the future development of highway transportation depend largely upon a broadening and improvement of the relationship of the public officials of the state, the cities and communities.

These relationships should establish a better understanding of our individual and common problems, and provide a definite realization that the working out of these problems to secure the best possible results for our citizens, who have placed this responsibility in our hands.

The elements of the traffic safety program in which this improved relationship should exist cover practically every phase of vital importance. Accident reporting, driver licensing, enforcement, engineering, traffic engineering, driver education and training, public information and organized public support are some of the most important.

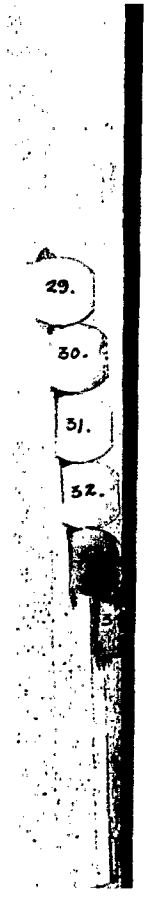
I feel that this is a worth-while expenditure of time and money by the state, and I assure you that the attitude of the officials and citizens of the cities in the Commonwealth of Massachusetts is for it 100 per cent.

In 1945 we found, like so many of you, that what is everyone's business is no one's business. Consequently, in 1945 there was no cooperation or coordination that was worthy of mentioning in the Commonwealth of Massachusetts in this inventory analysis. That rather alarmed me, as Registrar of Motor Vehicles, especially since the legislature, in 1946, had said that the Motor Vehicle Department of the Commonwealth of Massachusetts was to stand on its own feet and be subject only to the governor and the council and never again to be under the Public Works Department. Therefore, I felt that it was essential that we appoint some good men in my department to contact the officials of the cities and the towns in our commonwealth.

We started in 1946 to do a selling job because it so happened that previous to 1946, out of the 78 cities and towns in Massachusetts that have a population of 10,000 or over, only 27 had ever made a report. In picking the so-called experts, I was very careful to pick men with personality, ability and knowledge of all the different parts of this great program that makes up the analysis report, to send them out to meet the police chiefs, the engineers, the road builders and all the rest interested in highway enforcement and education and engineering in the respective communities.

They came back at the end of 1946, showing 100 per cent support for their efforts—78 towns and cities with a population of 10,000 or over (and I think Massachusetts has more of those than any other state in the Union) responded to our efforts, and we became a big cooperative organization of state, cities and towns.

Last year we broadened our scope. Not only did we get 100 per cent cooperation, not only did we sit down around the tables of the mayors and selectmen and all the officials of the communities and discuss the analysis, but then we said, "We'll broaden our program in our commonwealth." So we



contacted 53 towns with a population of from 5,000 to 10,000, and we worked with them.

Then we have gone another step further, we have worked out a program in our commonwealth to contact every town under 5,000.

In other words, at the present time in our state, 78 out of 78 cities and towns with populations of 10,000 or over are working with my department on a cooperative basis to save lives and prevent accidents. Fifty-three—all of the towns in my state with a population of from 5,000 to 10,000—are working 100 per cent. And 220 towns under 5,000 are now swinging into line.

No matter how small a community, it reflects upon the record and the efforts of the state. In Massachusetts we have a tremendous density of population, so it is important that we work with every community.

*Just before* I came out here, six of my men who have this work in hand reported to me that they had just been out and contacted every community that I have mentioned here in the "78" class and the "53" class, and they were received with open arms. Massachusetts is ready to go on this program of cooperation.

The governor of the commonwealth, his council, the state senate and the legislature are with us in every move that we make. Last year I requested a certain sum of money from the legislature, and I made certain other requests. Without changing the dotting of an "i" or crossing a "t" they gave it to the registrar of motor vehicles and the motor vehicle department without question. I asked for extra help to carry out this cooperative program, and extra money was granted, and new positions were created.

CHAIRMAN LINGO: We have come to the concluding report on our panel, and I'm not even going to ask a question of this gentleman. I have enough stars, as I mentioned before; I am not going to try to put him on the spot. I'm just going to tell him that in the estimation of most of us in this business, he is the man who has really "carried the ball," so to speak, in connection with this entire activity that we have been talking about.

He has seen the whole program develop from just a mere contest among states and cities to what we feel is the important program that is getting established now—the annual inventory.

I'm now going to call on Lew Wallace of the National Safety Council to summarize on what has been said, or to interject any comment he might have in connection with this activity.

MR. LEW WALLACE: On behalf of myself and those of us who have fought to make this activity succeed, I want to say to the officials of the states and the cities and the public support groups of citizens that there is much more for us to do. We realize that there is a means within our grasp of securing information and facts which can be developed to show every one of us what to do in the days, weeks and months and years to come that will save lives, human suffering, and billions of dollars.

We hope that we will not fail in the responsibility, the small share of the responsibility, that is ours in doing this job. We assure you that everything we have will go into the development of this program, with only one objective in mind—the best and the safest highway transportation system that anybody ever hoped could exist.

MR. LINGO: We will now proceed with the questions from the floor. Consider your questions at this particular time in the light of objectives of this meeting rather than the technical aspects which might be within the province of the Advisory Committee or some of the other organizations involved in the inventory program.

MR. WALTER L. FOX [Syracuse Safety Council, Syracuse, N. Y.]: I'd like to ask Chief MacDonald something relative to the completing of the inventory forms in states and cities. Who does the actual work of making out the forms in general? Registrar King mentioned how they work it in Massachusetts, but it may be that there are some other methods which might be of interest.

MR. MACDONALD: The persons that we designate under the term of inventory representatives were formerly called contact men. They are appointed to serve each state and serve each city. Various methods are followed.



Undoubtedly, in many cases the work of of the inventory representative has been "love's labor lost," because if the city or state didn't win the prize, the work done went into the limbo of forgotten reports.

You have heard that these reports are to be used not only for the judging of these contests but also for the President's Conference.

These contests have been going on under the direction of the National Safety Council for many years. Your chairman graciously didn't refer to the number of years I served on the board of judges, but I picked it up from Paul Hoffman in 1936.

The board of judges has only the record before it, just as any other court, so the responsibility that rests on the shoulders of the inventory representative to uphold the honor of his state and his city has been an important one through the years, from the angle of these contests. But now much more has been added to their responsibilities, since these reports have become the basis for the award in the pedestrian contest, the awards of the National Conservation Bureau, the American Bar Association, and the award of the International Chiefs of Police.

I pay tribute to these contest representatives for the work they do, year by year, without very much recognition. From now on they are going to be recognized all over the map, as you see.

I think the analyses that have been furnished under Mr. Wallace's direction, and with the work of Mr. Bennett and his staff, have been of tremendous benefit and form one of the most outstanding steps in the progress that has been made in these contests and in the perfection of the reports. I agree with Commissioner Magee on the matter of trying to judge all of the records by a standard that may not fit the circumstances. We are going to have to develop a yardstick for measuring results that will come closer and closer to perfection.

For example, we admit that many of the questions have been inadequate. They have been standard questions, but they have been inadequate to measure safety. We have given credit for new pavements, but we haven't perfected the safety angle or the safety significance by determining whether it was simply an old pavement renewed or whether added lanes were built on a congested street. If added lanes were built, greater safety would result. If the old pavement was renewed, we would still have the same traffic congestion.

In other words, these standards, so called, have not been precise measurements of conditions.

In finally taking advantage of the question that was asked me, may I suggest that all of you read—and particularly those of you who have to have your faith renewed as to cooperation and dealing with the different state or city departments, in obtaining this information for these reports—the definition of cooperation that was given by President Dearborn before the Executive Committee this morning, which was one of the finest statements of what cooperation really means that I have ever really heard. It will pay you all to read that report to the Executive Committee, in which he defined what cooperation actually means, and in which he stated the profound truth that in this safety movement there is sufficient credit for everybody if we do the job properly.

MR. LINGO: Are there other questions?

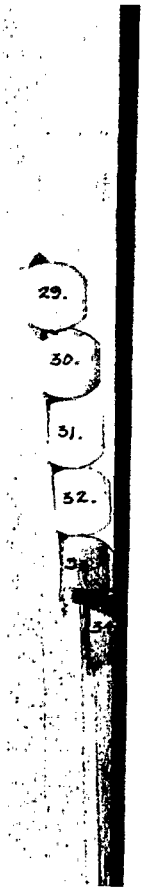
MR. WILLIAM S. FOULIS [Organization Director, Colorado Highway Safety Council]: Is the material provided by the cities' inventory reports used in the compiling of the annual progress report to the President's Highway Safety Conference?

MR. WEAVER: Yes, they are, Mr. Foulis. You heard the remarks made by Tom Boate with relation to the number of cities participating in the program. Also, Burt Marsh said that some 1,500 cities were in it, and the National Traffic Safety Contest had some 800 cities in it, so you can see how important it is to analyze and utilize the data prepared and supplied by the cities.

I think Registrar King's remarks about the type of job that is being done in his own state—in working on state-city cooperation—are most encouraging. That is a most important and effective operation, and if all states can do the kind of job that Registrar King's state is doing, working with the cities, we'll have a lot more and better data than we have now.

MR. LINGO: Thank you, Colonel Weaver.

COL. HOMER GARRISON [Director, Texas Dept. of Public Safety]: I'd like to direct this to Lew Wallace. I would



like to know whether or not it is the policy to keep the inventory material confidential for the use of state and city officials, or may it be used for public information?

MR. WALLACE: Our understanding is that the analysis made of the information in these reports is confidential to them, as far as their relationship between the Council and the city and state officials is concerned. However, we know of no instance (my good friend, Mr. Gill, brought up one case in which criticism was implied) where these analyses, after being checked fully as to the facts and the statements therein, were not released to the press and the public.

MEMBER: I want to ask Mr. Gill if, in developing his program in Oklahoma City, the organized public support has been brought into this program of action.

MR. GILL: The public support program in Oklahoma City was a cooperative program of all of the public support groups in our city welded together by (and I say this without any hesitation) our own local safety council.

It was done by going in to the various organizations such as the Women's Garden and Flower Club, the Parent-Teachers Association, the Lions Club and so on down the line, and presenting this problem to them: "Here it is. Won't you help us?" I have yet to find any organization of any kind that doesn't want to do something for its community. All you have to do is give them the opportunity and they'll come forth and serve the city.

MR. MITCHELL [Philadelphia, Pa.]: I'd like to ask Mr. Gill if this inventory and analysis has been helpful in setting up the budget requirements for traffic control activities.

MR. GILL: I believe it was the day after we sent in our inventory that we began hollering for our analysis to be returned, because we used the analysis completely. We relied on it almost in its entirety in setting up our budget, and we used it as factual information to present to the council and to interested citizens' groups, to show them what was needed in our community.

Before we began to use the analysis as a practical thing, we were appropriating about $45,000 to $70,000 a year for the bureau of traffic control. The first year that we began to use it, we appropriated $106,000. That doesn't sound like an awful lot of money, but after all, we're not too big a town. We have 260,000 in the metropolitan area. This year we will spend $130,000 for traffic control, in round figures. Well, that's 50 cents a head when you want to figure it out that way. I say to you that it is the most important thing that you can use in formulating the budget of your bureau of traffic control or whatever you may call your traffic control activities.

JUDGE CHRIS B. FOX [Police Judge, Oakland, Cal.]: Our local safety council president recently returned from a trip to the Midwest. He went up in the state of Wisconsin, to one of the large cities, and made the acquaintance of some of the city officials there. He learned that their safety record was excellent. They boasted of the few deaths in the city, but he observed upon the street that the traffic control was very poor, and the driving of the citizens upon the street also seemed to be very poor.

He went into another city in the same state and said to the officials of that city, "Why is it that in this other city I just visited, they have such very fine safety records, but the traffic control seems very poor?" The gentleman to whom he was talking said, "Well, if we kept our records like they do, we'd have a good safety record."

What do you do to check the veracity of these records?

MR. WALLACE: The gentleman has brought up a question asked many times in many different ways.

We started off with this definite philosophy, that we believe the officials of the states and cities and communities of this country are fundamentally honest, and if there are mistakes which can be made which are both good and bad.

When there are glaring discrepancies—and some of them have come to our attention—we, within the limits of our staff, have checked. I would like to say that when we have gone into those facts, they usually add up all right. We have had only one instance of what was seemingly—well, we won't call it dishonesty but we will call it inaccuracy—an unjustified report. That particular case was not called to our attention by our own staff or our own judges, but by the state official in that particular state for which the report had been submitted. It had not been checked by the administrator in charge of that division.



The state received an award for it. When it was called to the attention of the state official that they had received an award, the official said, "We don't deserve it. The facts given were not the truth. We ask that you take it back, but please don't tell anybody that we are as rotten as we're telling you we are."

We find that there is fundamentally no reason for checking facts, other than for the human errors that will happen, and, being human, we find that we have difficulty in checking.

MR. LINGO: Any questions having to do with the activities will be welcomed by the National Safety Council and by the Advisory Committee. Those two organizations—particularly the Advisory Committee—exist for the purpose of dealing with questions you might have in mind, so feel free to utilize those organizations at any time.

I hope that we have been able to give you some idea of the purposes and scope of this Annual Inventory, to point out to you just how it operates and what it does.

I am going to conclude my remarks with a statement that seems to me very important. It is the last paragraph of the letter written by General Fleming to Mr. Dearborn of the National Safety Council and it summarizes the responsibility of all of us in connection with this Annual Inventory.

General Fleming said, "In reviewing the elements of the President's Conference Action Program, I know of no other single activity in which state and city traffic administrators may engage that will contribute more substantially to a solution of their day-to-day traffic problems and to the nation-wide traffic safety program than by participating in the Annual Inventory of Safety Activities."

## The Manual for Traffic Court Judges

By HUBERT D. HENRY
Former Judge of the Municipal and Justice Courts, Denver, Colo.

Paper Presented by
EDMUND B. SMITH
Judge of the Municipal Court, Kansas City, Mo.

The program of improving traffic courts has gone through several phases. The first phase was the study of the courts and their operation, with the Warren report following, which showed quite clearly the deplorable state of our traffic courts. Next was the development of a public desire to correct the existing conditions and to bring about traffic court improvement. The third phase, and the one in which we now find ourselves, is that of furnishing aids to traffic court judges who wish to improve their courts. One of these aids is the series of conferences of traffic court judges and prosecutors.

In several states, manuals for judges have been written and supplied to various courts. These manuals have been produced in recognition of the fact that the judge who takes the bench for the first time may have very little knowledge of his duties—how to conduct a court, how to organize a court, how to act in court, or where to gain such knowledge. Some time ago it appeared that it would be desirable to produce a manual for traffic court judges which would answer these questions on a national scale. The National Safety Council decided to produce such a manual, and I was commissioned to draft it.

A first draft was completed and submitted for criticism and suggestions to several traffic court judges and others familiar with traffic court procedures. After receiving these suggestions, we decided to rearrange the material, enlarge parts, reduce other

parts, and to make the manual much more detailed and specific particularly as to the trial of cases. The new draft was begun in May, 1947, and I had every reason to expect to complete it by summer of that year. However, an event which was then wholly unanticipated, but which was not only to delay the production but which was to substantially change much of its contents intervened.

Quigg Newton, a young man of energy and ambition, was elected mayor of Denver and asked me to serve as municipal judge. It was immediately apparent that my viewpoint as a judge would be somewhat different from my viewpoint as a practicing attorney, and I felt that the writing of the manual should be delayed until my experience as a traffic court judge could be incorporated into the manual. But along with the good fortune attending my ability to incorporate personal experiences as a judge into the background of the manual came a presiding judge's responsibilities.

However, in spite of this great consumption of time by very necessary court activities, I have been able to devote some time to the study of the manual and to do some work in redrafting it. And in the absence of some unusual demands which are not now anticipated, another draft should be available in the near future.

The present outline calls for nine chapters:

1. The Traffic Problem.
2. Traffic Laws and Ordinances.
3. The Traffic Courtroom.
4. Trial Procedure for Traffic Cases.
5. Traffic Court Personnel and Duties.
6. Forms and Records.
7. Traffic Court Administration.
8. Violations Bureaus.
9. Improving the Administration of Justice in Traffic Cases.

*The Traffic Problem*—Here we discuss the importance of traffic safety nationally, to the community and to the individual. We also discuss the necessity of traffic regulations, the part of the traffic court in enforcing traffic regulations and the responsibilities of the traffic court judge.

*Traffic Laws and Ordinances* takes up the matter of the authority of the court and the sources from which derived—constitution, statutes, or ordinances. This chapter also goes into the jurisdiction of the court and its limitations.

*The Traffic Courtroom*—Needless to say, one of the most important phases of the traffic court *improvement* program is the insistence upon adequate courtroom facilities for all traffic courts. This chapter discusses this important item in some detail —the design, the appearance, and the courtroom aids.

*Trial Procedure for Traffic Cases*—This chapter takes the traffic trial from the arrest to the final disposition. It is in this chapter that the experiences of a traffic judge are valuable. A great amount of time is wasted in traffic cases. Some cases which could have been disposed of in ten minutes have taken two hours, and some cases which have taken ten minutes could have been disposed of in five. In order to assist judges in reducing the amount of wasted time in traffic cases, it is necessary to take up several of the more usual charges and go through the trial of these charges one by one, giving the questions which are most pertinent, the evidence which is most likely to be presented, and its meaning. In this chapter are discussed the arrest, the charge, arraignment, plea, evidence, verdict, sentence, and penalty.

*Traffic Court Personnel and Duties*—There are certain persons who should be present in every traffic court trial, and the absence of any one of them imposes additional duties on some other person. For example, the absence of a prosecuting attorney makes it necessary for the judge to question witnesses, and for him to do this he must step out of his role of arbiter and judge. Similarly, the absence of defense counsel imposes on the judge the obligation of seeing that some important point in the defendant's favor is not overlooked because the defendant has no attorney to call such point to the court's attention. This chapter includes a discussion of the qualifications of character and background which every traffic judge should possess.

*Forms and Records* should be simple, intelligible, and as few in number as possible. If a form contains a dozen unnecessary words whose principal purpose is to maintain in perpetuity legal mumbo jumbo of no real use, a layman will be more impressed by the failure to advise him simply and completely of the charges against him than he will be impressed by the mystery of the legal phraseology. Traffic court forms which are simple and efficient, while yet complying with all legal requirements, are presented in this chapter.

*Traffic Court Administration*—This chapter is designed to show how calendars are arranged, how dockets are kept, how to maintain and use records, and what to do about continuances, non-appearances, etc.

*Violations Bureau*—This important aid to the proper functioning of a metropolitan traffic court can do much to encourage respect or disrespect for traffic laws. It is important that it be administered properly.

*Improving the Administration of Justice in Traffic Cases.* Why must it be done? How can it be done? Who will do it? This chapter provides the answers.

Such a manual is not easy to write as it should be written. It must be simple and clear in language. It must be explicit. And yet, the treatment of traffic cases varies so greatly that if the manual is to be universally used we will have to show two or three ways of handling some things. For example, the trial of a municipal ordinance violation where such a violation is a civil matter is quite different from the violation of a state statute criminal in nature. Trial by jury is quite different from trial by a judge alone. These and many other matters of traffic court procedure can vary from place to place. If the manual is to be used universally, these things must be treated satisfactorily for all



## Public Support for Traffic Courts

By ELMER LOUIS KAYSER, Ph.D., LL.D.
Dean of University Students, The George Washington University, Washington, D. C.

Granting the vast progress already made, I believe I can safely say that the public's support of its traffic courts is far from being steady, consistent and intelligent.

You naturally look for a cause of this condition.

The basic cause, I am inclined to believe, is to be found in the fact that the public has not yet learned to think out the traffic problem in an objective way.

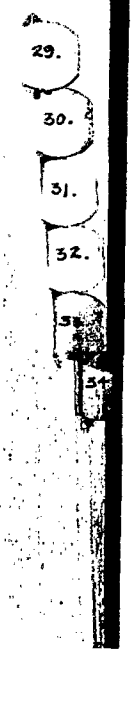
Part of the weakness is, of course, in human nature itself. The other man is always the violator. He is always the bum driver. He is always the road hog. He is the speed demon. Unfortunately, the problem is not that simple. There cannot be that easy transfer of responsibility.

Traffic is the whole problem of the movement of people and goods, and mobility is an outstanding characteristic of modern life. Ever since the manorial life of the middle ages broke down, human mobility has been increasing. The great changes of modern times arise out of a new correlation of man and the machine.

Just as the machine created the factory, the factory stimulated urban development, and increasing concentration has produced and intensified the modern traffic problem. The very essence of modern life is interdependence. Here we have 150,000,000 people with all that is needed to feed, clothe and, to a certain extent, shelter them, constantly on the move. To punish infractions of the rules which have been set up is your job. It is a problem of human engineering. Like all good judges and prosecutors, your business is, if possible, to work your self out of a job by meeting completely the problem that is your job.

But if the public attitude is too often neutral on the side of comprehension, it is often negative toward actual law enforcement. Its attitude is frankly unsatisfactory.

It cannot be denied that the public has in traffic matters worked out its own rationale of law-breaking. Unfortunately, it seems, that law-breaking in itself is not considered reprehensible. Many types of infraction are placed in a twilight zone, where the law-breaker feels no stigma and where the law enforcer receives little support. The cost of tickets paid for over parking during the year is totalled up and



advertised as cheaper than use of a parking lot. The officer ticketing cars or chalking tires is reminded that he had better spend his time catching this, that, or another murderer.

Unhappily, there is a widespread assumption that traffic violation is a relative thing where those of high position, economic power or political influence have special privilege. Unfortunately many usages, in themselves understandable, help support this erroneous idea.

I live in a city where it must often seem to John Q. Public that half the cars carry "Diplomatic," "Congressional," or "U. S. Government" plates. The popular mind is not particularly conversant with the legal niceties of diplomatic immunity and congressional privilege. "If he can, why can't I?" is asked more than once. Parenthetically, it occurs to me also that the panoply of speeding cars, screaming sirens and flashing lights might well be discontinued as a method of recognizing public distinction.

Finally I might point out, much of the public inertia and failure to rally to the support of its traffic courts is due to the resigned feeling that the traffic problem, like death and taxes, is just "one of *those* things"—nothing can be done.

Recently an influential national magazine in a much publicized article has again focused attention on a situation existing in some jurisdictions where courts and law officers use questionable devices such as speed traps and various lures to bring offenders into justice of peace courts where the motorist gets shaken down for the benefit of the private or public purse, or maybe both. If the usage were general there would be no reason why the public ever should or would support traffic courts. I grant that the practice was once, in some sections, blatantly widespread. But it is true that even in those areas, it is definitely on the way out. Organized motor clubs and the press can well finish the task that they have so well begun. Focusing on individual cases of bad practice (and I mean just that and not by indicting traffic courts as a whole), they can end the feeble survivals of a once popular racket.

The problem of public support for traffic courts is a problem of education on a community level and must be approached as such.

The organization of school children in traffic patrol groups has been productive of much genuine good, and is something for which motor clubs, school boards, the police and other interested bodies deserve the highest commendation. The schools are where we must start.

You and I have not by any means grown as rapidly as our traffic problems. We had a horse-and-buggy adolescence. Modern traffic is a part of the initial experience of youth of the country, and they can be reasonably indoctrinated in its problems with intelligence.

There is no reason why we cannot go beyond this first step of public cooperation through the schools in traffic control. There is hardly a school system in the land which does not have, scattered through the years of compulsory education, courses in community civics. Such courses might well make fuller use of the traffic courts through visits by directed groups, followed by reports and class discussions. When such community civics courses fail, it is often through the failure to introduce real situations into the study. The nature of the material and the importance of the problem would make traffic courts a fine educational clinic.

There is no sounder way of obtaining public support than by the development of lay cooperation. The groups formed in various communities of representatives of the bench, bar and laymen as committees for the improvement of justice have proved highly useful. These committees afford a channel by which civic leaders can be indoctrinated in the problems facing the courts. Each one becomes a key man in passing the idea on to his following. At the same time that the layman is being educated, he may, strange as it seems, be responsible for letting in some fresh air that the bench and bar can use.

The layman brings with him his own array of talents, many of which can be utilized by the courts. For example, many a court could stand some good advice from lay men on its administration of finances. Frequently a lay expert can offer sound suggestions on the keeping of records or on phases of the arrangement and maintenance of the court house itself. In the obtaining of funds for a new court house or for added personnel, the laymen of such a committee form admirable shock troops in dealing with legislative bodies.



Traffic courts will have to continue to look to the press more and more for help in building up public support. Consistent and objective reporting of traffic cases will help. Too often the only time the traffic court receives any space at all is when something on the man-bites-dog idea occurs. Such spasmotic, spotty and slanted reporting in a feature story generally adds nothing to the court's dignity or prestige.

The number of civic service clubs, motor clubs and kindred organizations that can help marshal support is legion. Traffic judges in many cases could help the cause by being more generally available for public addresses before interested groups.

While we are discussing approaches for the education of the public, it might be intimated that the rapidly rising premium on all types of automobile insurance will probably, if correctly interpreted, have some educational value in insuring fuller compliance with traffic regulations and heartiest cooperation with traffic authorities.

In all of these ways, much can be done, much has been done to bring added public support to the traffic courts. But the problem may be approached from another side, from the side of the courts themselves.

It has been an uphill job to get public support for traffic courts because the public often wonders when a traffic court is a court. In traffic matters judicial functions trickle down into the lower registers of the law enforcement agencies. When an offender reaches a traffic court, no single item of emphasis should be neglected to suggest the dignity of the court-room. Traffic violations are offenses and traffic courts are real courts.

The physical appearance of the court-room and its personnel are important. The time has long since passed, if it ever existed, when any old hole in the wall would do for a traffic court. Up-to-date buildings and equipment not only insure convenience and efficient administration. They can have a strong psychological effect which will interpret itself in wider respect and support for the courts.

Full use should be made of all technical aids which modern science provides in the presentation of traffic cases. The farther we can get away from the old ritual of "officer says you did," "you say you didn't," "judge says you did," the better. There are too many people under the impression that a traffic court is a place where fines are levied, rather than cases heard.

The monetary insignificance of so many traffic fines makes it easy for everybody concerned, if the point is not emphasized, to feel that traffic offenses are largely two and five dollar matters. The breaking of any law is far more serious than the trivial fines would suggest.

While penalties are often insignificant, it frequently appears that the real penalty is in the inconvenience and wasted time that appearance in a traffic court involves. I submit that in the modern administration of justice there should be no single spot where a man finds it cheaper to forfeit collateral than to have his case heard. Fewer continuances due to absent witnesses, otherwise occupied police officers and lawyers would help. Commodious arrangements for the reasonable comfort of those brought before the court as witnesses and defendants would also help.

So notorious are the delays and inconveniences attendant upon appearance in traffic courts that you often can see the witnesses of a traffic violation run as soon as the officer or one of the involved parties begins to take names down. Surely this is an unhealthy situation. It can be met by better administration and decent accommodations in the court.

It would be helped also by a changed and more understanding approach on the part of some courts. To the average citizen, the whole question of legal administration is confusing. Whether as defendant or witness, his appearance in court, unless he is a repeater, is apt to be a new, strange, and awesome experience. This should ever be remembered by the officers of the court. What to them may be a mechanical, boring and highly repetitive matter is not so to the quaking or perplexed citizen before them. That citizen's respect for the court is not enhanced by undue haste or unwarranted petulance and annoyance.

Again, to too great an extent traffic infractions are met by the apparently indefinite forfeiture of collateral. Cumulative traffic records should be more uniformly available. Repeaters should be forced to appear in court, because a minor offense frequently repeated is a major affront to the law. Forfeiture of nominal collateral time after time looks as though the privilege of violating the law can be purchased. The repeater is the best indication you can find that a system is not working.

These are just a few ideas as they occur to a lay man, for I am neither a lawyer, a judge nor an enforcement officer. But I am a citizen who wants to see traffic courts and all other courts gaining more and more public support.

Few of the problems of our democracy are as critical as the need for an increased respect for law on the part of our citizens as a whole. That respect which we want to awaken will manifest itself in more careful observance on the part of the individual and an increased concern for the zealous enforcement of the law. It will create the pressure that will lead legislative bodies into greater care in the drafting of laws and greater liberality in providing needed quarters, equipment and personnel for courts.

Far more of our citizens are charged with traffic violations than with any other type of violation of law. Perhaps more get their idea of our whole judicial system from traffic courts than from any other source. Of the twelve to fifteen million traffic violators this year, a sizable number will stand in your courts to be tried or prosecuted.

Pressing public interest demands a new dedication to the job before you. Primarily here is a problem of the machine age awaiting solution. The task ahead is to bring our citizens into conformity with their own laws, so that our restless society can keep men and goods moving without immediate and wholesale danger to life and property. We can bring new public support to our traffic courts only by creating a new social climate in which men will instinctively obey the rules of the game.

By working in and through the schools with youth, by adding new leavening to that group of public spirited men and women already enlisted, by developing all of the instrumentalities of the court as a social process, we can strive now toward a vastly enhanced support of our courts. We can at the same time create a social sense which will reduce the problems that these courts must face.

The firing line of our democracy stretches far. The defense must be as varied as the offense. On that front you hold an important sector. We, the lay men and you of the courts, working together can perform a vital service on that firing line. For no democracy will fail if its citizens, fearlessly and wholeheartedly, support the courts they have created for their own protection and their own regulation.

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## Uniform Laws

**(A Panel Discussion)**

*Discussion Leader:* Louis R. Morony, Uniform Laws Div., Automotive Safety Foundation, Washington, D. C.

*Participants:*

George W. Barton, Engineering Director, Associated Consultants, Evanston, Ill.

Judge Chris B. Fox, Police Court, Oakland, Calif.

Col. Homer Garrison, Jr., Director, Texas Dept. of Public Safety, Austin, Tex.

Lee C. Richardson, Director, Motor Vehicle Division, Dept. of State, Lansing, Mich.

William A. Sackmann, Assistant Attorney General, Colorado Dept. of Laws, Denver Colo.

CHAIRMAN MORONY: Our panel is well qualified to discuss the problem of uniformity from the standpoint of its practical application.



Discussing uniformity in the field of highway transportation we find certain areas covered by standards, particularly the five Acts of the Uniform Vehicle Code.

Second, the Model Traffic Ordinance has its basis in the several provisions found in Act V, Uniform Vehicle Code, and is recommended for adoption by all municipalities.

Third, in the development of land acquisition, the Public Roads Administration has prepared and recommends for state use the Model Limited-Access Highway Law and the Model for a Highway Development-Rights Law.

Fourth, as to the construction of the vehicle itself, we have such standards as school bus standards, equipment standards and AASHO size and weight specifications.

Fifth, the manual on Uniform Traffic Control Devices provides for uniform signs on streets and highways.

Uniform, standard, basic laws, in the final analysis, mean the development of easy transportation and easy understanding of the related elements of transportation that have to do with the laws themselves.

There probably isn't a man who, if he has driven far, has not been confronted with driving through jurisdictions where the traffic laws were not uniform.

In my opinion, when that happens, the man is going to follow rules of his own and not the rules of the jurisdiction through which he is traveling. He is not going to change his actions, and that is going to bring about confusion.

For that reason, this subject is so important it should be discussed as completely as possible. It should be discussed not as to what should be done—we know what should be done—but it should be discussed as to what is being done.

JUDGE CHRIS B. FOX: When you speak of uniformity as far as the individual judge is concerned, he certainly does not have in mind, when he is hearing the case and administering justice, that the law he is administering is a uniform act. He is unconscious of the fact that in California the California Vehicle Code is substantial enactment of the Uniform Vehicle Code. He merely administers it, and that is about the only concern he has with it.

Occasionally we have somebody from out of the State, or from some other town, perhaps, who makes a turn contrary to the statute, and he says, "We do it differently in our town." That of course is of small consequence and does not affect the general administration of justice in that court.

Starting with a model or an acceptable code or ordinance, certainly it is to the benefit of judges sitting on the bench to know that they are administering a piece of legislation that is acceptable throughout the country.

Coming down a little closer to home, in California the Vehicle Code is in substance a substantial enactment of the model code. Heretofore the ordinances of the various cities of the State of California had been rather intricate pieces of local legislation.

The League of California Cities, in 1946, drew up a model ordinance and distributed it to the various cities with the request that they endeavor to remodel their ordinances in accordance. This year they drafted another model ordinance which is based upon the Model Traffic Ordinance and this has been distributed throughout California.

Very recently the Supreme Court of California, by a decision, has boosted the uniformity of our Vehicle Code tremendously by a decision which holds that whenever the State of California sees fit to adopt a general scheme for the regulation and control of motor vehicles upon the public highways of the state, the entire control over whatever phases of the subject are covered by state legislation ceases in so far as municipal or local legislation is concerned.

Under such circumstances any local legislation is necessarily inconsistent with state law; Section 338 of the California Vehicle Code expressly provides that state traffic laws are applicable and uniform throughout the state and in all counties and municipalities, and no local authority shall enact or enforce any ordinance on matters covered by the Vehicle Code unless expressly authorized therein.

These ordinances, heretofore, have dealt with many subjects that are now set forth in the California Vehicle Code. For ex-

ample, double parking; passengers on motor vehicles; interference with fire apparatus; driving or parking on sidewalks; bicycles; street cars; safety zones; turning movements; pedestrians; stopping; standing; parking, and many others.

Those subjects are substantially eliminated from local city ordinances. Whenever local conditions require an amplification of these subjects, of course, and are not in conflict with state law, the ordinance can cover that.

Therefore, in effect, in California now we have a California Vehicle Code which incorporates a good many provisions of the Model Ordinance and which is now uniform throughout the state. Therefore, as far as we are concerned, I think we are in very fine shape on the subject of uniform laws in California.

CHAIRMAN MORONY: You said exactly what I wanted to hear you say, namely, that when a judge has a man before him in court the judge is looking at the statute in front of him, and in the back of his mind he hopes that the statutes are some day going to be uniform. He realizes there is real value in having them uniform.

I know of an instance in Miami recently when a man appearing before the court was making all kinds of excuses for running a stop street because the signs weren't the same shape as they were in his home state. The judge asked him how long he had been down there, and he said three years. It didn't take the judge long to decide what to do with the case.

MR. GEORGE W. BARTON: To the traffic engineer, the term "uniformity" usually brings to mind uniformity in traffic control devices. By and large, these devices, signs, signals and markings, are not a matter of legislation. The uniformity or lack of uniformity usually is the result of practice in any particular state or city.

There has existed for quite some time a reasonable set of standards in the form of this Manual of Uniform Traffic Control Devices, but the compliance with those standards still leaves quite a bit to be desired.

In one city recently a boulevard was lined with "No Parking at Any Time" signs. These signs were octagonal, black and yellow, identical in appearance with what was being used for Stop signs. The people in that community were a little perplexed as to why the Stop signs along that street didn't receive any better respect than they did, whereas, when looking down the street, No Parking signs and Stop signs were identical in appearance and you couldn't tell one from the other.

There are today good bases for standardization. In many states the State Highway Department or other agency of the state develops a state manual of traffic control devices which tell what type of device to use, when to use it, and how to operate it. In states where that state manual does not exist, reference easily can be made to this national Manual on Uniform Traffic Control Devices, which has recently been rewritten and is just off the press.

As far as non-uniformity in law affecting the traffic engineer is concerned, there are quite a few examples of that, too. In a number of instances, the traffic engineer would like to set speed regulations on a street or highway and base them on the conditions on that route. Frequently, though he finds his hands tied because speed regulations are set up definitely in a local ordinance or a state law.

One case in point is an instance where almost an express type of street in a community was to be signalized. It was desirable to set the signals to permit movement at something in excess of 30 miles an hour, yet because of the restrictions applied under the state law, the artery had to be set up to run at 25 miles an hour.

Other cases of non-uniformity in law might be cited, such as overtaking on the right. You run into difficulties on that when you begin to design intersections and do something in the form of channelization. Non-uniformity applies in the matter of method of making a left turn. One community requires the left turn to be made around the center point of the intersection, whereas other communities may prescribe that a left turn must be made just to the right of the center line of the crosswalk, there again affecting the design of the street you can use.

There are many examples of non-uniformity both in practice and in law that are of real concern to the engineer.

One other point relates to a problem which is of vital concern to every city, and of secondary concern to every state, and that is the matter of off-street parking.



City after city finds off-street parking one of its most critical traffic problems. The effort to do something about off-street parking laws is distinctly handicapped by the lack of legislation that authorizes action, permits financing, sets up the machinery for action. Admittedly, uniformity of laws relating to off-street parking is not the desirable thing, but certainly some standards in that direction are highly desirable. Cities and states are all working toward the correction of the necessary tools but, to a large degree, they are working in diverse directions.

The engineer needs uniform laws so that a treatment applied in one area can be applied in another. He needs uniformity of practice in traffic control devices so he can use a control measure in his town and expect it to be understood and recognized by visitors from other cities.

CHAIRMAN MORONY: The police, of course, have the major problem as far as uniformity is concerned.

COL. HOMER GARRISON: Uniform state and municipal traffic laws and ordinances are the first essentials of uniformity in traffic law enforcement. The public usually will accept a procedure that is generally followed throughout the country. We normally expect motorists to be conversant with our laws and rules of society. However, this cannot be possible unless every state and every community have and enforce the same rules.

Lack of uniformity in marking of no-passing zones and other physical features of a street and highway system makes it extremely difficult to establish a uniform policy.

With uniformity in all levels of traffic control, the educational job will be simplified, since one set of rules only will be all that needs to be taught.

Traffic safety should be taught in all secondary schools in the country, and all media available should be utilized in disseminating information to the public. From then on the job is that of maintaining an awareness of dangerous practices that are prohibited by law.

CHAIRMAN MORONY: The President's Conference in 1946 recommended that states and cities make comparative studies of their motor vehicle laws and traffic ordinances, to determine to what degree uniformity prevailed. As I understand it, one of the objectives of the State Officials' National Highway Safety Committee is the support of that recommendation.

MR. LEE RICHARDSON: The objectives of the State Officials' National Highway Safety Committee are just what we are talking about.

Twenty years ago the National Conference on Street and Highway Safety started something along this line. They accomplished a lot, but it really wasn't until the President's Conference in 1946, out of which came the Action Program, that we really got down to work.

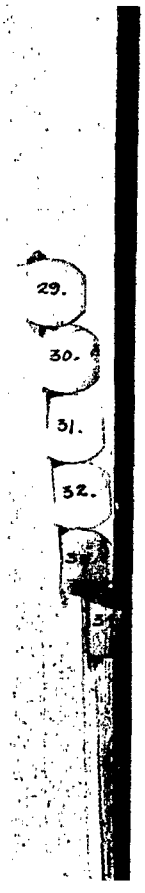
We in Michigan have always been firm believers in uniformity and have taken steps over the years along those lines. I am thinking about certificate of title, operators and chauffeurs, and general highway use laws.

In fact, quite a number of years ago Mr. Morony held the position I hold today, and he prepared and almost completed a recodification of our motor vehicle laws. Due to the change in administration, however, that was thrown into the discard, and later on when we looked for it we could not find it, and it was left up to us to begin all over again. We wanted to do the job he started and which we knew so well should be done.

A resolution was presented in the Michigan State Senate 1947, creating a senate interim committee of three members, to study the motor vehicle laws. We invited them to work with us, offering to do the job for them, because it provided us the vehicle with which to do just what we had wanted to do by ourselves. That job was completed and presented to the legislature in special session last March. It outlines the five acts of the Code, and on one page appears the code and on the other page the comparison with Michigan law, and then space for comments and future study.

The letter of transmittal that accompanied this document when it was given to the legislature by the senate committee said in part:

"In May 1946 as a part of the com-



prehensive program for greater safety on public thoroughfares, the President's Highway Safety Conference recommended that state legislatures take definite action to promote nation-wide uniformity of traffic laws. *In accordance* with that suggestion, and also in recognition of the long-standing necessity to eliminate the confusion, inconsistencies and duplication which have grown up in the motor vehicle laws of Michigan, the senate *in 1947 unanimously* adopted Senate Resolution No. 37 providing for the appointment of a committee of three to study the motor vehicle laws and to make such recommendations as the committee deems necessary to the senate at the next session."

It goes on to tell about the advisory committee, consisting of representatives of all state departments having an interest in traffic safety.

"The results of the study are presented in this document which the committee hereby submits as an interim report. It provides a factual inventory of those Michigan motor vehicle laws which lend themselves to comparative comment, with accepted national uniform standards. The committee feels this is essential for considering revision and codification.

"Moreover, it will have a continuing value as a reference guide for future legislatures in considerations involving uniformity. While this statutory analysis is detailed and accurate, it is in no sense intended to be definite or final. The document is to be regarded rather as a check list and special pains were taken to keep it as brief as possible so that it can be reviewed quickly.

"The purpose of a presentation of this kind is to alert the reader, not to prescribe a course of action. Indeed, it is essential as a precedent of action that the Michigan Acts and comparative studies should be read in their entirety. It should be noted that the committee has refrained from making any recommendation for this purpose in the report. It was felt that a more careful and thorough study should be made of columns 1, 2 and 3 before definite recommendations were made. However, upon completion of the basic study the committee reached one definite conclusion: Michigan's motor vehicle laws should be restated in code form for more clarity, for better understanding and for better administration.

"This statement of our motor vehicle laws in code form has been completed and will be presented for your consideration. It should be remembered, however, that the committee feels the job is not done but that this is the first step, and sets up a framework around which future legislation may be patterned. It permits an intelligent and enlightened consideration of needed reforms that may be brought out later.

"The committee feels further study and analysis is not only desirable but necessary in order to place Michigan in a position of leadership in the field of motor vehicle use and motor vehicle law administration."

Now we are presenting the report to interested groups over the state, judges and prosecutors and police, the trucking people, users, and others, asking for comments, and when that is done in the next thirty days we will have material to draft a bill for presentation to the next legislature.

CHAIRMAN MORONY: Colorado is another state taking an interest in this problem.

MR. WILLIAM A. SACKMANN: Colorado is making a factual comparative analysis of our traffic code with the Uniform Code. These studies entail not only our laws, but the rules and regulations and forms used to carry out the law as set up on our books.

Colorado, I believe, went one step further than Michigan in that we are using federal funds to carry on this study. We were fortunate in having the full cooperation of the Federal government and the Public Roads Administration, and their planning survey fund is helping us in this study.

The Director of Revenue is interested from the standpoint of license fees, collections, and various functions.

The state patrol is interested from the enforcement angle. Public instruction is interested in comparing our school bus regulations with the uniform laws. The Attorney General is primarily interested from the legislative viewpoint, because, in the long run, the legislature turns to the Attorney General to help in formulating the legislation. The Secretary of State is interested because of the registration laws, and the uniform registration law is a vital part of the uniform code.

The public utility commission is interested because of the trucking interests and the trucking laws and weights and measures, and our state highway engineer and the highway department are vitally affected by any legislation that might be passed.

Once this comparative study is finished, we can begin to evaluate and see where Colorado can correct the errors to make Colorado highways safe, not only for Coloradoans but for every person of any other state who drives across Colorado. They will be cognizant of our laws if we have uniformity as a by-word.

I believe uniformity is the keynote to real traffic safety, and I think Colorado is taking another step toward that goal.

CHAIRMAN MORONY: There is much more of this work going on. Lansing did a study following the job done in the State. A codification job was carried on back in 1943 in the development of the Maryland uniform code. A comparative study of the municipal traffic ordinances of the City of Chicago is going on now.



## Progress in Intoxication Test Study

By MASON LADD
Dean, Iowa Law School, University of Iowa, Iowa City, Iowa; Chairman, Executive Committee, Committee on Tests for Intoxication, N.S.C.

The Committee on Tests for Intoxication is nearing the end of its most successful and productive year since prewar days, but still there appears the prospect of even greater progress to come.

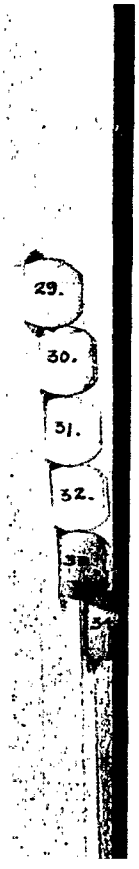
Early in 1948 the Licensed Beverage Industries, Inc., made a grant of $20,000 to the National Safety Council to carry on the committee's work. This grant has enabled the Committee to initiate several programs which have been in the hoped-for stage for several years. In order to bring about the most effective use of the funds, an executive committee, with myself as chairman, was appointed and held its first meeting in June.

It was in 1939 when this problem of drunken drivers and their great hazard to safety of our public was fully realized, and when the possibilities of prosecution through the use of some scientific tests, rather than pure guesswork, came up.

At that time I became interested in the matter and gave it exhaustive study. It is amazing to see the progress from that day to now. As you know, just a little over a year ago, the Supreme Court of Oregon, in the case of the State vs Brown, gave it a full constitutional bill of health, even though the consent of the accused had not been given, holding that it was not a denial of the privilege against self-incrimination because the accused was not compelled to speak. It was just like taking fingerprints or any other objective test.

Of course, in other states we had the admission of these tests, where there had been consent on the part of the accused, and under those circumstances the test was solely on the ground of whether it had legal efficacy and fact. The courts have uniformly, throughout the country, now almost universally accepted these tests and the results of them as corroborative evidence to be considered by the court and jury in determining whether or not the person accused was really guilty of operating a motor vehicle while intoxicated, or whether he had a headache or whatnot.

As a result of a meeting of the executive committee in June, as well as the terms of the contract with the Licensed Beverage Industries, a full-time secretary was employed, and $5,000 was assigned to the Northwestern University Traffic Institute to carry on a training program for chemical test technicians and to promote the use of the tests through training schools, police associations, and conventions. A technical committee was appointed, with Dr. Clarence Muehlberger, Michigan State Toxicologist, as chairman, to set up and supervise research projects at universities on comparability and reliability of tests. An



appropriation of $5,000 was made for this purpose.

This testing program is being carried on and the results of the tests, available by the end of a year, will be given publicity both from a scientific and general public reading interest standpoint.

The first training school under the grant was conducted at Northwestern University in July, in connection with the National Institute for Traffic Training. Dr. Harger, Dr. Heise, Dr. Muehlberger and Lieutenant Borkenstein, all committee members, and Dr. R. Forney, assistant to Dr. Harger at Indiana University, and Robert Donigan, legal counsel at Northwestern University Traffic Institute, all took part in the course. Twenty-two police officers, attorneys and laboratory technicians from ten different states attended.

Considerable time has been given to chemical tests at the several Judges and Prosecutors Conferences sponsored by the American Bar Association and Northwestern University Traffic Institute during the year. In addition, instruction on the subject at the long and short courses conducted by the Traffic Institute has been considerably enlarged.

Michigan State College has embarked on a research project on comparability and reliability of the several chemical tests. A fellowship has been granted to a graduate student who will conduct research throughout the year to develop new and authoritative evidence on reliability of the various methods. This project is scheduled for completion in August, 1949.

With employment of a full-time committee secretary it has been possible to step up promotional activities in the field of chemical tests for intoxication. A statistical summary on use of tests was compiled and several thousand copies have been distributed.

Dozens of cities and states have been aided through regular mailings of the new monthly newsletter, pertinent studies, new court decisions, and so on. In addition, materials on all phases of the program have been sent to hundreds of persons who have requested information.

We constantly receive questions and requests for information about handling these tests, the technics and the procedures. We have a pretty good supply of material, but will have some new materials, simplified, modern, streamlined procedures worked out, I hope, by the close of the year, which will be very helpful.

The pamphlet, "Chemical Tests are Fair," has been reprinted and several thousand copies already have been distributed gratis. *Public Safety* magazine has carried articles dealing with the testing procedures used in various cities and states throughout the country.

During the coming year we can look forward to even greater activity. The end of the research project at Michigan State College should produce a report that will plant chemical tests for intoxication on an even firmer scientific foundation. Possibly further projects will be attempted, delving further into the "tolerance" problems, and so on.

Incidentally, all of that work will be reviewed by the experts throughout the country, with the idea of having a thorough, accurate check, and with the hope that this study will have the endorsement of the scientific people of America familiar with this particular subject. Possibly further projects will be attempted.

It takes a great amount of time to work these tests and get results. The "tolerance" problem is one that should be gone into even further, although pretty good results are available now.

The legal members of the committee are planning to produce a new summary of the legal aspects of the problem. Many states are planning to introduce legislation along the lines of the provisions of the Uniform Vehicle Code, and the next Congress should see several new states with such legislation enacted.

Legislation would be very helpful, even though the courts have been quite receptive to these tests. It would eliminate the need in certain instances of prolonged examination of an expert with the various type of hypothetical questions interrogating them, and it takes so much time of the courts. If we only had legislation in every state on this subject, it would be of tremendous value, because the legislation takes the result of the scientific test in percentages of alcohol in the blood and the scientific deductions from them, and makes merely the finding of fact in the case of a particular accused presumptive of that result, without all the need of expert scientific evidence.

It is planned to publish a booklet containing reprints of *Public Safety* articles on the subject early in 1949 for wide distribution. The training program, conducted by Northwestern University Traffic Institute, will be expanded and carried into several sections of the country. Requests for material indicate many cities and states will begin use of chemical tests during the year.

Work of this committee and other groups interested in the problem is bearing real fruit, and needs only continual nourishment in the way of intelligent research and promotion to attain its proper standing in the traffic law enforcement field.



## Uniform Enforcement

**(A Panel Discussion)**

*Discussion Leader:* Robert L. Donigan, Counsel, Northwestern University Traffic Institute, Evanston, Ill.

*Participants:*

Judge Roy De Gehr, Municipal Court, Seattle, Wash.

Judge Henry Hart, Municipal Court, Midland, Mich.

Howard W. Hoyt, Chief of Police, Kalamazoo, Mich.

Daniel G. Reynolds, Assistant Director of Field Service, International Association of Chiefs of Police, Evanston, Ill.

CHAIRMAN DONIGAN: Uniformity is a highly desired objective of everyone in this field, and one of the greatest projects that has been developed in the past few years is that project of uniform enforcement in the State of Michigan.

The state itself, through various municipalities, municipal officials, state officials and others, has developed a system which has created a great deal of interest. It originally started in five pilot cities. One of them was Kalamazoo. After the pilot experience, it was adopted by a number of other cities so that in the State of Michigan we have over thirty cities following this policy of uniform enforcement.

Because a great deal of the spadework was done by police officials, it is fitting that Chief Hoyt, of the pilot city of Kalamazoo, should start the discussion.

MR. HOWARD W. HOYT: In discussing with other police administrators this uniform enforcement policy of Michigan, I find there are a lot of questions as to why it was started. I thought I might review them because those problems that brought us to thinking along this line are uniform all through the country.

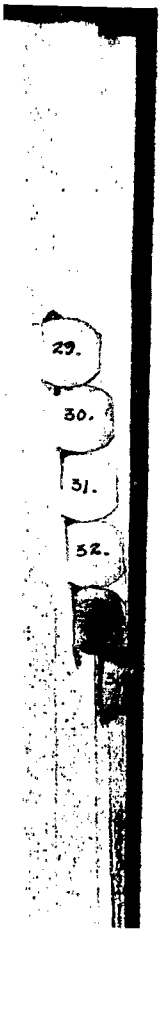
All of you as chiefs have had your officers come to you and say, "Chief, what was wrong with that ticket I wrote yesterday? The fellow was speeding; he was going three miles over the speed limit. My speedometer has been checked, yet my superior officer tells me, 'Use your head.' Just where is the division line in 'using your head'?"

Or, some other officer will say, "His wheels had not stopped rolling; he was still in motion; he never came to a complete stop. I gave him a ticket. True, he might have been going slower than one or three miles an hour, but five miles an hour across that Stop sign is a violation because the law says 'Stop'!"

The chief scratches his head and says, "Son, use your head!"

What is "Use your head"? His definition of good judgment differs from the chief officer's idea of good judgment. So, we were all confronted with that problem, and in order to establish a policy in the department that we could dictate to the men in our training schools, we began thinking along this line.

Then, too, we in the police profession feel we should have scales and measurements, rulers, whatever you want to call them, the same as a chemist has his formulas, the engineer has his blueprints, rules, gauges, calipers, and so on. We too should have measurements by which we can measure violations definitely.



How did we start out? How did we get it going?

The Michigan Association of Chiefs of Police has been long active in bettering police administration problems. One of our most active committees has been the Committee on Traffic and Safety. In the laps of this committee was laid this problem.

This committee was not large enough, we felt. Neither did we have the talent to properly effect what we were groping for, so we included what we call an advisory committee, composed of every chief of police and every traffic bureau commanding officer in the state who could serve.

We started out on a sound basis by taking the actual statistics of the state and finding the major violations causing the greatest number of our accidents, and we attacked those major violations first.

We started out first with ten, reduced it to eight, and finally reduced them to six violations. Then we started working on the degrees of violations. Speed is easy; you have some form of measurement there. But when it comes to improper turns, or Stop signs or red light violations, your degrees are not so easily worked out. With this larger committee, then, we worked out these various degrees of violations.

We wanted to get it down on a sound basis so that we could actually determine that this violation is a 1, 2, 3 or 4 or A, B, C, D type of violation—some figure. We called them "points" to start with, but we discarded it very shortly and used the word "units."

We started talking about a speeding violation of a value of 1 unit, 2 units, 3 units, 5 units, and so on. The same with the other types of violations. They were rated by numbers of units.

The result of that was that very shortly we started talking about some type of traffic ticket on which we could record these violations as the officer wrote them on the street, and which would show graphically the seriousness of that violation.

You have all seen the uniform violation notice, rather than uniform ticket. We call it a uniform violation notice, on which is recorded the violation in various stages of severity, from the least severe on up to the most severe type.

One of the reasons we will tell a police officer to use good judgment in making a certain arrest, and that we will criticize another officer (probably a recruit) for not using good judgment in an arrest is the conditions around the arrest. For example, we all have intersections in a 25-mile zone where we would highly compliment an officer if he made an arrest of someone going through that intersection at 27 or 28 miles an hour under certain conditions.

We have an intersection at the Central High School in Kalamazoo where there are many night programs, concerts and the like; with signal lights, and a narrow street. On a wintry night when the street is covered with ice, when about 4,000 people have just been released from the high school, I would highly compliment an officer who gave a man a ticket for going through that area at 28 or 29 miles an hour.

On a Sunday afternoon, with no car or individual anywhere around, on a bright, clear day, with a dry pavement, I might question his judgment in issuing a ticket at that time, for the same amount of speed. Therefore, it is the conditions that exist which tend to make the violation more severe. It is a more accident-producing type of violation.

Then we checked these conditions that go along with the violation that make it more severe. These conditions are visibility, light or dark, condition of the street, whether wet, icy, slippery, dry. If there are any other vehicles in the vicinity that might help contribute to the accident, or any pedestrians be might hit, it certainly would make a difference, because one of the first cries a man will give to you is, "Sure, I ran the Stop sign, but there wasn't another car within twenty miles of the place!" These conditions were built into this traffic ticket too, and were taken into consideration.

After months and months of work, it was time to put it into actual practice. Five of us volunteered our Departments as pilots to put into practice this method we had developed. These five cities were Bay City, Saginaw, Battle Creek, Jackson, and Kalamazoo. The smallest is about 40,000 or 50,000 and the largest is around 95,000 or 100,000 population.



We had a good product to sell, but before we could put this to work in any of these pilot cities we were sure we were going to have to have unanimous approval of what we call our official family. Our city manager or mayor, our municipal justice or judge, the editor of our newspaper, radio stations, our city commission, all those in authority, were going to have to be thoroughly sold. So in each of these cities the whole thing was laid before them.

We were able to get the support of the entire official family in each of the five pilot cities. Then, since this could not be put into effect efficiently until all the officers were thoroughly trained, we arranged a 12-hour training course, using some of the staff from the IACP Traffic Division at Northwestern, using some local talent in each case, using Maxwell Halsey and Captain Scavarda extensively, in each of these cities. The schools were set up for the five cities on a circuit basis so that the same instructor could go from city to city.

After the twelve-week training period, the program was put into effect simultaneously in all of the cities.

We ran into difficulties with it. As you know, it is set up in such a manner that a violation up to a certain degree is considered or treated as a warning ticket or a warning violation. For example, speeding between the limit and 5 miles over the limit is a 1-unit violation in itself. If it is done after dark that would make it a 2-unit violation. If the pavement is slippery and icy it would become a 3-unit violation, and if there are other cars and pedestrians present it would make it a 4-unit violation.

We said in our training to our officers that a 1-unit violation is not serious enough to deserve a man's attention. There are other things you can be doing on the street more important than stopping a 1-unit violator. Anything from 2 units on up should be stopped, if it is convenient, and if you can without interfering too much with the traffic and your other routine duties.

We originally set "3" as a par, and anything above 3 we considered in the fine classification, and anything under that would be in the warning classification, unless that individual had an accident record or a record of previous violations, in which case it would be treated the same as a ticket.

One of the things we were most concerned about—and it is the thing that invariably you other police administrators question—is, "Don't your boys take advantage of that warning angle of it and start writing all tickets as warnings, making themselves good fellows to the public?"

Our experience has been exactly the opposite. We had hoped this form of enforcement would increase our police-motorist contacts numerically, in that we would be able to cut out those below a certain degree that we had established before; and all above this we arrested. We contacted quite a few motorists on top of their fine.

We had hoped our fine tickets would not increase too much but that our warning tickets would increase materially.

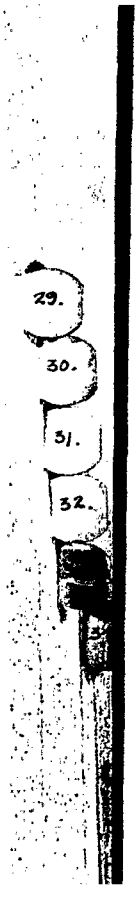
It didn't work that way. As a matter of fact, the first two or three months in my own city of Kalamazoo we did not have over 5 per cent of our tickets which were warnings. The officer had the attitude of the typical old-time officer, namely, that if he is worth stopping, brother, he's worth stopping to pay a fine.

After one or two years' work with the boys, they will begin to admit that perhaps the better of the two contacts is the warning.

Some of the men are just now beginning to agree that perhaps they are making a better contact for the city, for themselves and for the motorist, too.

We finally had to change our par to 4 instead of 3, because we were not getting enough warning tickets. The chiefs of all five of these pilot cities, together with their traffic managers, would meet about once a month after we started this experiment, and would discuss some of the problems we were running into, and almost all of our problems were the same.

We found it necessary, after four or five months, to have another refresher course for the men, and during that time the importance and value of the warning was stressed. The men are 100 per cent for it now, I believe. Some of them were a little skeptical at first. Our public is strong for it.



With the recent training school held last January for the other 29 or 30 cities in Michigan that have adopted this, we were able to prepare and present a much better school than the previous one had been. The publicity kits that Maxwell Halsey and his group have been able to prepare are much better than the ones we had originally for selling the program. The publicity through radio and newspapers is very satisfactory.

All in all, I will have to say it is a marvelous success. We wonder why we didn't think of it a long time ago.

CHAIRMAN DONIGAN: Now I think we should hear the judicial angle.

JUDGE HENRY HART: The basis of the whole thing is the ticket, and you received a lot of that discussion from Chief Hoyt. In putting over this uniform policy it was realized that public education to get the public's support was of greatest need.

Talking about the violator after he receives the ticket and comes to the traffic window; a large proportion of violators now come to the traffic window still thinking the only purpose for giving them a ticket is financial, that the city needs support money. They don't realize the whole idea behind the ticket is traffic regulation and prevention of injuries and accidents. Why is it that they think of the money and the fine they have to pay, rather than the offense that they have committed?

A person goes through a Stop street in one town and is fined $2, and goes through a Stop street in a town some distance away and is fined $15. Immediately his attention is drawn to the discrepancy. He goes away with the idea, "The town that fined me $2 was a sucker, and the town that fined me $15 gypped me." He has no idea why he was fined nor the reason behind the fine, because he doesn't stop to think.

A person will come in with a speeding ticket after speeding 5 or 10 miles an hour over the limit. In most towns they have some sort of schedule saying that at 15 miles an hour they will be fined $7. Another man, maybe a neighbor, going 15 miles an hour over the limit, is also fined $7; but conditions were different.

Our first man going 5 miles an hour over the limit, in the afternoon on a dry pavement without much traffic and pays a $7 fine. The second man was driving on a slippery, sleety pavement at night, going through heavy theater traffic, and his fine is also $7. He comes back to the same proposition, that the fine was $7 in both cases.

I must judge my case on the facts surrounding it—that is one thing that the uniform ticket is for—giving the full and complete background of the defense and the conditions that existed.

Our city is one of the 29 in Michigan that has adopted uniform fines. In other words, similar fine for similar offense right down to the dollar for the six most numerous offenses. They do not take into consideration drunken driving, reckless driving or 20 miles an hour over the speed limit, but we do have uniform fines for the six units because we think it is the best thing.

The usual argument is that you are abusing the judge's discretion if you tell him the fine is uniform. You are taking away his discretion to hear the case and to decide what the fine will be. I think most conscientious judges in the past, when violators have come before them with a similar offense under similar conditions, have in their own minds set up just about what the fine will be, on the basis that those who commit similar offenses should be treated the same.

I think we have all set in our own minds a uniform (although somewhat haphazard) system, because we depend on memory rather than on cases and drivers. In the larger cities hundreds of thousands of people who come in and plead guilty are fined without the benefit of judicial discretion, and this has been remedied somewhat by the uniform fine system.

In taking this judicial discretion into consideration in the large traffic bureaus, I think the best substitute is the uniform traffic ticket, because in some measure it answers all the questions a judge would put to a violator, and thereby gains information on which to base the fine.

For instance, the judge might sit down with the man and say, "Let's see—it was raining, it was slippery, there was traffic," and he uses discretion from the knowledge gained. If the judge cannot sit down with the violator he can use the uniform traffic ticket which tells the whole story, in what



neighborhood it occurred, and it gives a complete background of the violation. That is the best substitute for the actual contact between the judge and the violator.

In our own town of 60,000 people we see a majority of the violators. I think the advantages gained by the uniform traffic ticket outweigh the disadvantages of infringing on the judge's discretion in traffic cases. He uses his discretion now only in cases where a contestant comes before him. This allows a wider use of discretion, and I believe it is a step forward in traffic enforcement policy, treating everybody the same.

If you ask them a question at the traffic window, they will say, "Can't you cut this down a little bit?" You can say, "Would you want to be treated any differently than anybody else?" They invariably say "No." That is the answer.

CHAIRMAN DONIGAN: It might be interesting to the members here to know some of the figures given me by two cities that have adopted this plan in Michigan over a six- to eight-month period.

In Grand Rapids, personal injuries have dropped 16 per cent. The number of tickets increased 56 per cent, from a figure of about 7,200 to over 11,000. The fine cases have increased about 30 per cent, from a figure of about 7,200 to over 10,000.

In Judge Hart's city, a smaller community of 16,000 population, personal injuries dropped 63 per cent. Tickets issued for control numbers increased over three and one-half times, from 230 to around 815. The number of cases on which fines have been levied have increased more than double, from 230 to over 500.

MR. DANIEL G. REYNOLDS: As Max Halsey has aptly put it, we speak of uniformity—but what good is uniformity of traffic laws unless you have some uniform application by the police, in the first instance, and by the judges in the second instance? In other words, you might have wonderful uniform laws, but unless they are uniformly applied they don't mean a great deal.

In the police profession one of the things we have to develop is more measuring sticks. One of the things that has been very illuminating to me, both as a police officer and in traveling for the IACP, is to go into cities and see the hunting that some of the chiefs take, and their administrative officers in the city also, by newspapers and by the public, for the simple reason that they have no barometers to defend themselves.

The chief is conducting an enforcement program, for example, or a campaign (If he is not careful he may use that term). He has nothing to use to defend himself. This program used in Michigan brings out the fact that traffic violators are causing the accidents, and therefore the emphasis is being put on these traffic violations that are causing those accidents.

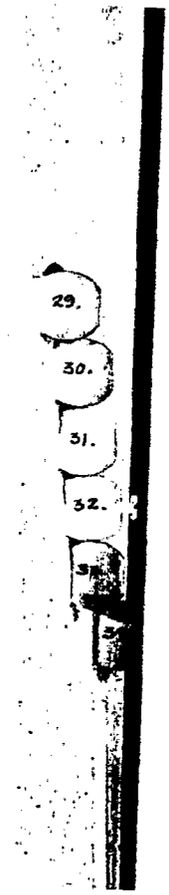
Has the police administrator something to stand on? He certainly has! He has his own figures in his own city, and he has the support of the organizations in his state. He doesn't have to take a beating. He has a planned approach. The police officer in the field has the same thing: He has a measuring stick. Instead of measuring yards or miles, as we used to do, we are down now to feet, and we hope eventually to inches, because the officer is out in the field and is measuring the contributing factors—the violation itself, the factors that make it a large violation, a small violation, or whatever it might be.

I have had the experience of helping to develop the program in the original instance, and in talking with a great many of the Michigan officers who are now using it. Some of them were skeptical, as Chief Hoyt admitted. It looked too simple, as though we were trying to put something over on them.

As a matter of fact, once the officers got used to this they liked it because they could measure it. They had something they could take into court and when they testified, if necessary, as to a speeding case, let's say, they had some other factors to indicate whether it was a serious violation or not.

I know that policemen have hobbies. We had men in my Department, for example, who never arrest for speeding; other officers are interested only in Stop sign violations; with others, the minute they smell a drop of intoxicating liquor on a person, they put him in jail for drunken driving.

With this kind of program you have something to sell to the rank and file. You have something to sell to your administrators, your people, your press, your city



authorities, and your judges. As these judges will admit, it simplifies their problem a lot. Many of the questions they ask are right on the ticket.

From what I have seen as an outside observer of this program in Michigan, I think it is a wonderful thing for the police profession. I can't say too much for the people who have had an important part in the development of it. I see no reason why it won't fit into any city in the United States. So far it has gone to some of the cities outside, and I will be interested to find out, for example, how it is going today in Seattle.

There is no reason why it won't work. It is a step forward in the police profession.

CHAIRMAN DONIGAN: I would like to call on Judge DeGrief of Seattle to tell us what they have done with the plan in Seattle, and how it is operating there.

JUDGE ROY DeGRIEF [Seattle, Washington]: I have taken a broader view of the topic. I want to discuss somewhat in detail the joint responsibilities of the police and the courts, and connect that up with the uniform enforcement. I feel that the police officers have a threefold responsibility: They are responsible to the public, the court, and to their superiors, while the courts are responsible only to the public.

I think we have all had the belief that the courts should be an independent tribunal and subversive to no one, no group of people, no branch of the government or any particular individual or society.

With that in mind, I think we will agree the officers are more or less the right arm of the court; so the two together have a joint responsibility to the public.

Our traffic laws and ordinances, in order to be properly enforced in the first instance, must be reasonable and fair, and must meet with public approval, else we will not be able to enforce them regardless of what system of enforcement we have, whether we use the system they have in Michigan or California or whatever state it might be.

We must realize that it must have the support of the public. The Michigan authorities and the courts there have done a very good job in getting public support through a system of education. As I understand it, they *didn't try this in one* week or two or three—they educated the public for several weeks and several months before they started this program.

The purpose of the law enforcement officers, and the traffic courts in particular, is to get *uniform enforcement* of the different laws. Enforcement by the officers should be fair and impartial, and the penalty or punishment system by the courts also must be fair and impartial. I think the American people are so constituted they will agree to any policy they believe to be fair.

So, in following out this idea, the police in Seattle have more or less copied the Michigan plan. Basically, we have about the same ticket citation as they have; we have the unit value system; also the A-2 unit for a certain violation of an ordinance if there are no hazards connected with it, that is, if the streets are not slippery, if the traffic is not heavy, and if it happens in the daytime when the weather is fine; then we excuse the first ticket if there are none of those hazards.

It may be a 2-unit ticket and still be excusable. However, if it is connected with one of the hazards we do not excuse it but place a $2 value on each unit, and as the defendant's offenses increase, that unit value goes up.

In other words, the second offender and the third offender are punished more severely than the first offender. That makes what we call an "equitable" ticket. The equity courts do not follow the principles of law as much as the law courts do, and this ticket may be aptly called an equity ticket; that is, you are punished more for the more hazards that are connected with your driving.

I think we agree that is a fair way to enforce the traffic laws. That would not only be applicable to the traffic situation, but I think to all other court cases that might come up, whether in traffic court or some other court. We have equity courts to try cases where the rules of law are not exactly applicable, and these tickets follow that out to almost the nth degree.

In Seattle, we also have a system in addition to the Michigan ticket, namely, imposing a higher fine for a speeding violation and a second offense for a Stop



sign violation or a prohibited left turn or any other minor violations.

Up to 55 miles an hour we have a system of imposing a fine of $5 for the first 7 miles over the speed limit. (First I might say we have three speed limits, the 25, 30 and 35 mile speeds. Those are the three basic speed limits in Seattle.) For the first 7 miles over the speed limit in each zone the fine is $5. We have an additional $1 for each mile up to 54 miles an hour. Over 54 miles and up to 60 the bail is $50. Anything above 59 miles an hour isn't given a citation, but the case is booked directly to police headquarters, and the defendant is charged with negligent or reckless driving, or whatever the facts of the case may warrant.

I have used this system for at least a year and it has worked out very satisfactorily and has met with the public's approval 99 per cent of the way. The public is satisfied with the system because it feels motorists are being treated fairly. If I can judge the American people at all, that is all they want—to be treated fairly.

The fines and the arrests must be more or less uniform and impartial, and yet the fines, especially to date, can hardly be made exactly uniform because the purpose of the courts is to deter the defendant from letting the offense happen to him again, and whatever will accomplish that is adequate punishment.

In other words, you might have a case where a man was in an accident and probably had his arm or leg broken and several vertebrae fractured. I don't know whether the same fine in that case that you would impose upon another man who had had the same infraction of the traffic rules, would be just or not. The mere fact that this fellow was required to walk on crutches or with a cane for the rest of his life certainly would deter him from ever letting that offense occur again, just as much as a heavy fine or some jail time that would be uniform in that particular case.

If we do have this uniform fine I think there must be some exceptions to it, and the courts should be left to make some discretion. In other words, I don't believe we want the courts to be a mere "stand," in the aggravated cases at least. They hear the case and apply the law to the facts in the case and give the same fine to every defendant. I don't know whether that would be exact justice or not, and that of course is the purpose of our courts.

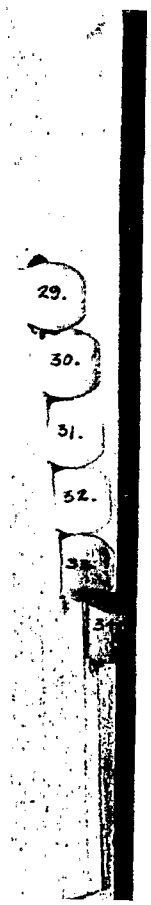
The courts are to give out such judgments and verdicts as will lead the public to believe the courts have been fair with them, and if the courts do that they will not only serve their purpose as traffic courts but they probably are going to serve a purpose in uniting the people, because the people who feel they are being treated fairly by their courts are going to have the same American view as their neighbor, and they are not going to have that Bolshevik view.

When we consider these things and the purpose of our courts, it is somewhat questionable at the present time, I believe, whether we should have this exact amount of fines for the same offense, or not. I think that would work out very satisfactorily for parking and the minor offenses, such as running without lights or not having an adequate horn, or no horn at all on the car. Probably if they had them in the different states it would work out very well.

When it comes to the aggravated cases, I have my doubts as to whether the fine could be uniform or exact in every case. I think the main thing the courts should do, and the police officers want to have the public know this, is that they are going to be punished for every violation of an ordinance or rule of the road. The fine or punishment need not be the same in every case. I think the fine should be commensurate with the facts in the case.

Whether one person should be fined $25 and another $50, I think, depends somewhat upon the person's position in the community, whether he is working for $4 a day or whether he is working for $20 a day.

Getting back to the Michigan ticket, as I say, we have tried it in Seattle basically the same as they have done in Michigan, and it has worked out very satisfactorily so far, and I think one of the main reasons for it is the fairness of the ticket. The officers think it is the fair thing to do in setting forth on the ticket the different hazards connected with the way the accident happened or the way the defendant was driving.



This gives the court a better view of the situation, and when the defendant hears all these facts related by the officer and then related by the court, and is told the reason for the fine and the punishment, he is satisfied that he has had a fair trial and, of course, is satisfied that he has had all the facts presented to the court, and he goes away satisfied, and has instilled within him a desire to obey the laws from then on.

If the courts don't instill within the defendant and the driver and the jaywalker a desire to obey the law from that time on, and if he pays his fine and forgets about it, he has then wasted the court's time and he has wasted his own time.

In conclusion, I would say that the Michigan ticket is properly called an equity ticket, and I hope before many months or years have passed it will be used not only in the cities in the midwest but will be taken up by all the cities on the coast.

CHAIRMAN DONIGAN: There may be members of the audience who would like to ask questions.

VOICE: I would like to ask Chief Hoyt what system of citation or summons do the officers use for charges that are not on the ticket?

MR. HOYT: You will notice there is one line: a division between the violations and the conditions, where it says, "Other violations." In there they place the violation in writing, the same as they used to on the old ticket—any violation that is not one of the big six.

VOICE: None of the panel members has mentioned the technic of license revocation. The discussion has been limited to penalties by way of fines.

I would like to address a question to Judge DeGrief, first, whether under his particular statutory circumstances he may revoke the operator's privileges, and, if so, whether that is employed for repeating defendants or defendants with higher records?

JUDGE DeGRIEF: Under our law in Washington we not only take the license for different offenses, that is, suspend it or revoke it, but the law compels us to take the license for at least thirty days in every case of reckless driving where there is a plea of guilty to reckless driving, or where the defendant is convicted of reckless driving.

We may suspend it for as long as a year under that particular law, but we must take it for at least thirty days. The law also compels the courts to revoke the license for three convictions in a year.

When the defendant is convicted or pleads guilty to drunken driving, the license must be revoked for one year.

JUDGE HART: Maybe we are a little behind in Michigan. It is mandatory to take the license away from three months to a year in drunken driving; three offenses for reckless driving in a year call for license suspension. Outside of that, the State police have records of traffic violations, and they are brought before the State Police Board. They take the license away for any number of months up to a year. That may be appealed to the Circuit Court in case the violator doesn't agree with it.

JUDGE DeGRIEF: Also, I might say, in Washington, with the number of violations even for minor offenses within the year, the Director of Licenses has been calling in the defendant and generally puts him on probation; and then, if he has another accident or violation after that, an aggravated violation, the Director of Licenses is empowered to take his license without a court hearing.

Also there is a statute providing that, when a vehicle strikes another vehicle and no one is injured, the Director of Licenses is authorized to take the licenses. If anyone is injured in the vehicle that is struck, and the defendant is convicted of the offense, then the court is compelled to take his license for a year.

VOICE: I would like to ask a question of both the Chief and the Judge: An officer made out a ticket and later he came back to me and said, "That fellow we gave the ticket to the other day passed me on the street today and laughed at me! Nothing happened!" Am I to tell that officer he has done his duty in handing out the ticket, and that it is none of his business what happened? How should I answer him?

MR. HOYT: With the system we have, the officer writing up the ticket on the street—although he knows it is going to be a 2- or 3-unit violation ticket, which is normally a warning ticket in our setup—does not so advise the violator. He writes out the ticket as though it were any other kind, and for a period of 24 or 48 hours that violator is in suspense, thinking he is going to have to pay the regular fine, and he will have to if he has a previous record.

That is the reason the officer on the street can't say, "Mister, this violation isn't so serious. I am giving you a warning." The officer writes the ticket out as he sees it, and he writes it down in that manner. The man then comes to the violation bureau and lays it on the counter. The violation bureau clerk checks his record and finds no record of previous violations, and comes back to him and in words about as follows says, "Sir, your violation was committed under rather favorable conditions. True, it was a violation. You have a clear record with us, as far as any previous violations are concerned, and therefore this is going to be recorded as a warning. It goes against your driver's record but it will not cost you anything."

We have prepared a mimeographed letter, signed by the Chief, which is given to the violator at the same time. The violator does not go down the street to the police officer and say to him, "I got out of it and it didn't cost me anything!" He has something hanging over his head. It is now against his record in the violation bureau, and he knows it is there.

We have found he is very thankful—as a matter of fact, he is very courteous and appreciative to the officer, because the clerk said, "This ticket written by the officer indicates the violation was not committed under serious conditions." He knows that is right. He goes out very appreciative of the officer who wrote the ticket, and says, "That man just used good judgment; that's a smart policeman!" He goes out also with a good feeling toward the Police Department.

I have had a lot of business men tell me that for once we are getting our enforcement program on a business-like basis.

JUDGE HART: There are not too many violations in our small town. However, if I am not available, or am in court trying a jury case, if the person wishes to pay a fine, when I have set it as a probable fine, he may pay that fine and leave. If he can come back, the clerk will ask him to come back.

The traffic window is the place for education, and it depends a lot on the person you have at the traffic window. If you see all the violators yourself it is more beneficial than just taking their money.

JUDGE DeGRIEF: Since we have adopted the Michigan ticket that very situation has come up several times. I do not think a person is going to stand on the corner and laugh at a policeman, because he will be driving his car thereafter. I don't think he would take a chance at laughing at a traffic officer.

Our Chief of Police has advised each officer not to inform the defendant about the ticket. The officer simply gives the violator the ticket and says nothing about it.

The violator is put to the trouble of going to the traffic violation bureau and finding out if it is a violation ticket. Maybe he loses a half day's work in order to do so.

After the first offense within a year in our court, a courtesy ticket cannot be issued. There can be only one courtesy ticket in a year's time. In our violation bureau we have the alphabetical system, and each driver in the entire county is listed according to his name; so we have a complete record, a warning ticket record and every other violation of that particular driver throughout the year.

If the officer will follow the Chief's instructions and say nothing about it, the situation the gentleman mentioned never will happen. It has worked out very satisfactorily in Seattle.

CHAIRMAN DONIGAN: In other words, the warning feature of the violation is not determined until the violator appears in the violation bureau or before the court.

VOICE: On the matter of the mechanics of the record-keeping of the motorists Judge DeGrief just mentioned, they apparently maintain records on a county basis, on the assumption that a motorist is from some other county. How would you determine what his record was if he received a citation in Judge DeGrief's court?

JUDGE DeGRIEF: We have a cross-index. We have the license number and also the name. Generally those out of the





county, where it would cost more—say it is a minor infraction of the law; it would cost more to bring him in on a warning, and we do not bring them in when they are out of the county. I might say that the people have responded wonderfully to the letter that the violations bureau has written. I would say 90 per cent of them answer that letter, either sending in a check for the violation or dropping in to the violation bureau. When they are out of the state it is impractical to enforce the violation. We have that cross-index on the license, and the man is traced and the letter is used to enforce payment of the violation.

MR. DIVINE [Oakland, California]: I notice in the speed section, Chief, you break it down into 5 and 6, and 9 and over 10. Do I understand all speeds over 10 are grouped in that "Over 10" section? Also, below that, increasing the seriousness of the violation, there doesn't seem to be a great deal that describes a serious violation. Maybe a man has had a few drinks and might be cutting in. Would he be charged the same as one who, we will say, is doing just 10 miles over the limit?

MR. HOYT: No. Our instructions to the men include that on speed they write in above this, with lead pencil, heavily, so that it goes through all four carbons, the exact speed. For example, if it is 38 miles an hour in a 25-mile zone, the "13 miles" is written above the speed limit. They write the exact amount of speed in there.

I think our violations bureau's schedule, set up by our Municipal Judge, is based on so much for 5 miles and under, 10 and under, and over 10 it is in 5-mile groups above that. On the back of the ticket the officer turns in to the violations bureau, there is a place for the officer's comments, where he can list other conditions, such as, the fact he could smell alcohol on the man's breath, any defects he happened to notice in the car, and so on. If the person is from out-of-town, he includes any personal identification.

VOICE: That brings to mind another question: Does this pamphlet get general distribution—the one that signifies a series of units, $2 fine, $3 fine and $4 fine? If that has gone out to your citizens, do you have any difficulty from them or do you take these other things into consideration in assessing penalties?

MR. HOYT: You will notice on the bottom it says, "$5 additional fine for each 5 miles above the 10 miles over the limit," with an arrow pointing up to that column. That would clear it if we had a citizen who became that curious about it. So far, we haven't.

As a matter of fact, this part of the uniform fine program did not have too large distribution or too much publicity. Our courts adopted it. There were stories in the paper and on the two radio stations about the fact we had adopted it, and that thirteen other cities in the State have also adopted it.

MR. HARRY TAYLOR [Connecticut State Police Dept.]: Has the number of arrests or warnings increased in Washington under that system?

JUDGE DeGRIEF: The number of arrests has increased. We have had the same experience they had in Michigan. We started out with 2 units for a warning ticket, and they were issuing so few that they increased it to 3 units.

MR. TAYLOR: What is the ratio now between the warning and the summons?

JUDGE DeGRIEF: It is increasing now, but for several months it dropped very low.

JUDGE HART: As Chief Hoyt told you, there weren't as many warning tickets written as expected. It was anticipated more tickets would be issued, and it would mean more contact with the public. There weren't enough warning tickets issued at first, but they are increasing some at the present time.

MR. TAYLOR: How about the treatment of out-of-state motorists? Do you bother them at all?

JUDGE HART: Uniform fines is our answer.

MR. TAYLOR: If the man is from out of the state, he will say, "The hell with it; I'm not going to go to court!" Do you have any means of checking on him?

JUDGE DeGRIEF: If it is a parking ticket or some minor violation, and the citation is placed on the car, there is no way of bringing him back without taking a loss; but if it is for speeding, the arrest is made right in the jurisdiction of the court, and then he is brought in the same as any other person.



MR. TAYLOR: Is he brought in immediately?

JUDGE DeGRIEF: He is allowed to post bail. For negligent driving, if he is given a citation for that, he can post bail, and if he drove on to Portland or Oakland we would just have to let him go, unless he were good enough to put up the bail or pay the fine. It would not be a fine—it would be forfeiting the bail.

MR. TAYLOR: What do they do in Michigan?

JUDGE HART: In our town, drunken driving would mean apprehension and jail.

MR. HOYT: On the more serious violations, out-of-state drivers are brought down to post bail. The bond the judge sets for that particular violation is the same for the local residents. For the not-so-serious cases—I mean by that speeding under 20 miles an hour, or whatever it might be, they issue regular tickets, the same as anyone else, and if the violator does go on to another state we send a notice to the police in that state. We have reciprocity with other states.

I know there is scarcely a month that goes by without our having to go out and pick up a driver's license ticket for one of our local citizens who failed to answer a violation in another state. We do it for other states and they do it for us.

JUDGE CHRIS B. FOX (Oakland, California): Concerning the statements that your police officers in Michigan make on the back of the ticket, giving any additional facts, saying the man has been drinking, weaving in and out, or any other point, we used to do that in California until they enacted a statute preventing it and making it contrary to law for an officer to do that.

That causes me to wonder: At the actual trial of the case, the judge will get the citation and complaint, and there might be a question of whether or not the judge is actually taking into his mind evidence which is not produced on the witness stand, and whether or not counsel would object to that.

MR. REYNOLDS: It would show on all of the copies. That was the big objection in California.

JUDGE FOX: I know it would be absolutely contrary to our statute, but I am thinking of whether or not the counsel for the defendant in a highly contested case might not say that the court, in effect, has prejudged the case because he has taken into his mind those check marks on the citation.

JUDGE DeGRIEF: Would he get that ticket unless it was introduced in evidence?

JUDGE FOX: Of course it is not introduced in evidence; it merely serves as a complaint. There is a certain amount of conclusion of the officer which reaches the mind of the court. The officer makes a police report. If the police report is on the judge's desk and he looks at it and reads it, the counsel for the defense knows he is disqualified and can't try the case. He has evidence before him.

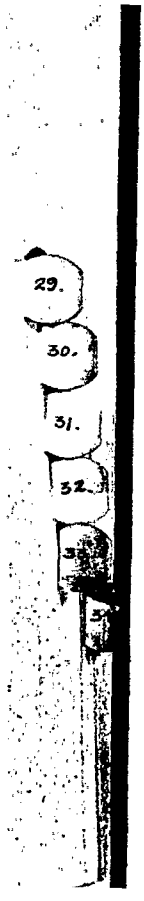
JUDGE DeGRIEF: How about an officer making notes at the time, and referring to them if he doesn't have an independent recollection of all the facts in the case?

JUDGE FOX: There is a lot of difference between making notes on the citation used as a complaint, and making notes that the officer puts in his pocket and uses to refresh his recollections when he is on the stand. I don't know whether you see the point I am trying to make.

CHAIRMAN DONIGAN: Aren't we losing sight of one of the primary purposes of this? Many of these violations are settled in the violations bureaus, as they are in California, and it gives a measure by which a penalty may be assessed on a uniform scale in a violations bureau. If a person does not settle his violation in the violations bureau, or if it is one of those types of cases where he is not permitted to, this does not become part of the judge's complaint—the complaint the judge has before him when the case is tried.

It does have this effect, that the police officer, who ordinarily would discharge a man who was speeding, had had impressed upon his own mind other factors surrounding the offense, which may affect it in a more serious manner and make it a more serious violation, so that when he comes to court and testifies you are not taking any arrest slip or any violation note as evidence of the complaint.

He testifies to these other factors which, under the old system, he may not even



have seen or noticed or thought of, particularly in the courtroom.

In most of the courts I don't think the judge ordinarily has the slip. The purpose of making notations is for your records.

JUDGE FOX: I would like to ask one other question: When a ticket is presented to the violations bureau you have the man or woman at the wicket or window, and let's say it is what is known as a non-serious ticket. If you say it is for a very low speed, with no other elements in it that add units to it, that constitutes a ticket that can be excused if the person has had no previous record in a year.

Is it possible that that person at the window will exercise a greater discretion and excuse tickets that have one or two additional units added? By giving such discretion to the person at the window, isn't it possible for him to go along and actually "fix" tickets?

MR. HOYT: They have no discretion in this. The only way it can be done would be for them to erase the carbon in some manner or other, and that could be done on the old ticket. In other words, they will erase the number of miles and change it from 40 to 30, or something like that. They could change this from a 4-unit to a 3-unit, for example, by erasing the darkness feature or the slippery pavement or other traffic, or something like that; but they cannot change it otherwise because it is either a 3-unit or a 4-unit. There is no leeway. That is the beautiful part of it.

CHAIRMAN DONIGAN: These tickets would always show whether or not the personnel has abused the tickets, if they were audited.

JUDGE FOX: We don't have auditors do that checking, unfortunately. Do you have yours checked by an auditor?

JUDGE HART: All the tickets I have to go through personally. I can have personal control of my tickets; otherwise it would involve changing the records, because the officer would wonder why the person he arrested was not fined, and it could be checked up that way.

# The Engineer Looks at Accident Records

(A Symposium)

## Are Data on Roadway Characteristics and Control Devices Useful on the Accident Report?

By ARNOLD VEY

Traffic Engineer, New Jersey Department of Motor Vehicles

The accident report, in addition to maintaining necessary driver records, has two primary purposes: first, for the determination and measurement of the general over-all accident situation and, second, for the necessary corrective action from the standpoint of engineering, enforcement and educational procedures.

The report is designed to supply the essential facts concerning the circumstances, conditions and situations at the time of the accident. The majority of items contained in the report concern such circumstances, conditions or situations which are not constant but are likely and in most cases do vary from hour to hour and day to day. There are, however, two items in the report regarding physical conditions, namely, road characteristics and traffic control devices which are substantially constant for considerable periods at any one location. The only exception is in the case of traffic control signals. The type of signal operation may change from time to time or because of equipment failures or other reasons the indications may not be operating.

Accident investigations of individual accidents or at high accident locations readily determine the character of roadways concerned or the presence of and type of traffic control. This is further substantiated by file records of the responsible agency.



From a strict engineering point of view, therefore, it is not essential that the accident report contain either of these two items. However, from the viewpoint of determining and constantly measuring the over-all accident situation, useful primarily for educational purposes, these items included in the report are helpful. For example, through such periodic statistical summaries, road characteristics are related to the over-all accident frequency and, similarly, accident volumes are related to the use or non-use of the various types of regulatory and warning devices.

The completion of these items on the report by the drivers involved at times assists in the identification of the exact location of the accident.

## What Special Analyses Are Useful to the Engineer

By M. C. CONDREY

*Acting Traffic Engineer, Cincinnati Division of Traffic Engineering*

Traffic accident records are sometimes said to be the basis for all engineering studies which is not far wrong. Thanks to the accident records and the enterprising engineer who decided to analyze them with respect to the types of conflicts causing accidents we now know the four basic causes of accidents and how to construct highways which eliminate or reduce these types of conflicts. Unfortunately freeways are not readily adaptable to urban areas except at tremendous costs and while most large cities will have some freeways and modified expressways, a major portion of the travel will be over existing streets. The chief task of the engineer will still remain that of making better use of the streets we have and the accident reports will still play an important part in determining where and what improvements should be made to facilitate the movement of traffic with speed, comfort and safety.

From a public standpoint, the engineers' primary objective is to reduce the total number of actual or potential accidents which means giving attention first to high accident locations regardless of any other factors. One of the primary uses of traffic accident records is in locating these high accident locations. This is accomplished by the use of spot files or spot maps. In addition to the spot map showing all accidents special maps showing pedestrian accidents by day and night, night accidents, child accidents, residence of drivers and pedestrians, locations of fatal accidents, etc. are utilized for this phase of the work.

The next use of the accident records is to aid in the correction of conditions at these high accident locations. This necessitates a thorough study of the individual reports at specific locations to determine their causes and the remedial measures indicated.

Next in line are "before and after" studies where improvements have been made. Since many corrective measures do necessitate some inconvenience or delay, the engineer usually attempts to adopt such measures that will accomplish the desired results, with the least amount of inconvenience. The only real way of determining the effectiveness of control measures is to see whether they are accomplishing the desired purpose.

Another use of accident facts is to justify action, either positive or negative, on demands for signs, signals or other control devices. Engineers are sometimes criticized for making a negative use of accident records and accused of waiting until the "horse is stolen before locking the stable." However, it is not practical to erect control devices at every location where an accident might occur nor can any great reduction in accidents be made by the erection of numerous signs, signals, etc. at points where accidents are not happening.

Another very important use of accident records is in "selling the need" for certain improvements to the public and to officials who make the funds available for them. Although there may be other important factors having a bearing on a certain change or improvements the most impressive fact from the public standpoint is the probable reduction in accidents. A few examples of

this which also brings out a few of the special studies are as follows.

Speed restrictions are probably the most distasteful to the public in general but much of this can be overcome by proper speed zoning. Special studies with respect to the relation of speed to accidents at specific locations not only assists the engineer in determining the safe speed at the particular location or area, but when the public is made to realize that limits are being established on that basis they are more apt to observe them voluntarily.

One way streets are becoming a necessity insofar as increasing street capacities are concerned but they do cause added inconvenience to some persons. Before and after studies of accidents on existing one way streets are a definite aid in promoting additional one way thoroughfares.

Accident records are also used to evaluate the necessity for thoroughfares or measure the value of existing ones. This requires a great amount of special analysis work but in view of the high cost of constructing or modernizing existing thoroughfares it is time well spent.

Other uses of accident records in the engineering field are to develop educational activities, to provide information to the public and to develop changes in traffic regulations. Also, since most police departments or educational bodies do not have men with sufficient training for accident analysis work they usually look to the engineering divisions for the accident facts required in their fields.

The above are only some of the standard uses now being made of accident records but given sufficient time and personnel there are many useful studies that could be made in the fields of accident prevention, in the establishment of accident rates for various elements of design and the development of accident expectancy rates.

Accident records are and will continue to be one of the most useful sources of information for traffic engineers.

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## How Can Driver Data Be Used?

By J. E. JOHNSTON

Traffic Engineer, Department of Roads and Irrigation, Lincoln, Nebraska

The traffic engineering use of driver information supplied on accident report forms is limited in its adaptations. In order to define the scope of this phase of the discussion, those items included on the accident report referring to driver data include driver age, sex, race, occupation, residence, violation, condition, and drinking. A discussion of the use of driver data in its application to traffic engineering will be confined to these topics.

In discussing this subject, it is difficult to keep the issue clear to the degree that driver information is applied to traffic engineering uses only. Driver data probably has greater significance and is more directly usable by the enforcement and educational departments. However, the driver is certainly one of the important factors in the engineering approach to any traffic problem, especially in the consideration of specific cases.

The engineer is primarily concerned with the ability of the average driver to negotiate rapidly, safely and conveniently the highway facility which he provides. The engineer is ordinarily more concerned with what the driver does rather than the physical condition which made him do it. In general practices of design, the engineer's job is to measure what it is that drivers are doing and then attempt to design the facility in such a way that it will accommodate these actions. As an extreme example of this technique, it could be assumed that if all drivers were drunken drivers it would then become the engineer's problem to design a highway to accommodate them under these conditions. Fortunately, however, only a very small percentage of the drivers operate a motor vehicle while under the influence of intoxicants, and this factor has relatively no influence upon general design practices. It is conceivable that where the accident



reports indicate a large number of drivers involved in the accidents being under the influence of intoxicants in an area possibly adjacent to taverns, a special attempt should be made to provide traffic control devices that might be a little more evident to persons under this influence. Certainly in such areas the presence of any surprise conditions which normally tax the driving ability of the sober driver should be eliminated.

The Nebraska Traffic Engineering Department spends considerable time in making surveys for municipalities located along our state highways. Invariably we present comparisons of the percentages of local drivers involved in accidents with the foreign drivers. In other words, driver data is used in this respect usually to point out the fact that the need is not for some highway improvement but rather points to the responsibility of the local people in the causation of these accidents and the need for education as to the hazards which exist on the highway and correct driving and walking habits.

Driver data is not used in this instance as an indication of the best type of traffic control, which would be an engineering factor, but rather belongs to the educational department. By the same token, our engineering reports frequently refer to the types of violations which also prove the responsibility of local people in this regard and the need for enforcement and educational techniques. As a tool to relieve the pressure from the engineering department, we have found the use of driver data included on accident reports, as described above, of great value. We have found, in the main, that from 50 to 85 per cent of the drivers involved in these accidents live within 25 miles of the scene of the accident, or that they are fundamentally local people. We use the argument that little can be done to educate the foreign driver to drive differently through their community, whereas the local people can be reached through educational processes.

Accidents involving disobedience factors with reference to stop signs and traffic signals are helpful in pointing to the need for improving the visibility of such devices, providing better advance warning and revisions in signal timing.

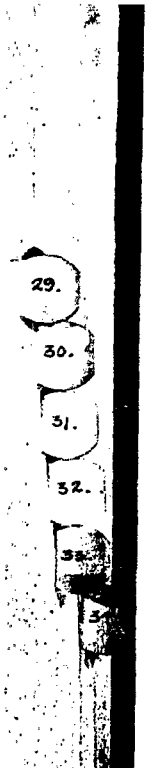
Where there are a great many accidents involving vehicles maneuvering into or out of parking positions, there may be a need for revision in the type of parking, angle of parking, and design of the parking stalls. An indication of accidents involving an excessive number of improper passing violations might point toward the need of installation of no-passing zones or the provision of additional lanes for movement. Where there are a great many accidents occurring because vehicles followed the vehicle ahead too closely, there may be a need for the provision of extra lanes or the application of reasonable speed limits, or the provision of deceleration or acceleration lanes to permit vehicles to enter and leave the highway safely.

Driver data referring to violations involving "exceeding the lawful speed limit" have little value from an engineering point of view. The great majority of the reports indicate either exceeding the lawful limit or exceeding a safe speed. The fact that a vehicle is exceeding a lawful limit usually loses its significance due to the fact that most lawful limits penalize anywhere from 35 to 70 per cent of the driving public. The fact that one of these violators happens to become involved in a traffic accident should not single him out with reference to the speed law infraction.

It is not conceivable that the condition of drivers has any bearing upon the engineering approach except to the degree that such inefficiencies alter the mass data.

The race of drivers has some significance in considering the engineering features of a traffic problem in some areas. There is one area in particular in Nebraska which has a very high proportion of foreign workers of the uneducated type. In considering the design of new highway facilities in this area, it has been felt desirable to keep all traffic movements as simple as possible. For example, a traffic circle was considered at one time as the most desirable way of regulating traffic at one particular location. However, due to the high percentage of foreign and poorly educated element, it was felt that such a facility would only be a source of confusion.

These same factors could be applied to facts regarding occupation. If those involved in accidents were of an occupational character which would reflect a low type group educationally, or at least a group which were unaccustomed to some of the



more modern traffic treatments, certainly such facts should influence the engineering design. As an example, a study made recently in one of Nebraska's western cities indicated that some of the trouble encountered was due to the prevalence of a group who seldom came to the city and who were accustomed to driving about the open range country unhampered by parking restrictions, traffic lights, or other traffic regulations. Certainly in the application of traffic control in this community, from the engineering standpoint, this factor would carry a great deal of weight.

The above factors were brought out in the consideration of mass data regarding the residence of drivers by population areas in relation to accidents by population areas. It was found that there are more drivers proportionately living in villages of a population of 1,000 or less having accidents than there are proportionate accidents occurring in this population group.

This conclusion does not seem unreasonable in view of the fact that inhabitants of smaller villages are unaccustomed to high speed and congestion which occurs in larger cities, thereby becoming involved in traffic accidents especially when away from their own community. From this premise, it is evident that even in larger cities the matters of driver race, occupation, and residence should be carefully studied in connection with any new traffic facility.

In conclusion, driver accident data can be used by the traffic engineer for the purpose of correcting the operation of present control devices and regulations, the design of engineering improvements which can be comprehended by the driving public, and to prove that the problem is not one necessarily requiring engineering treatment.

## What Does the Highway Program Mean in Safety?

By ROY E. JORGENSEN
Deputy Commissioner & Chief Engineer, Connecticut Department of Highways

We highway engineers and other sponsors of a big road improvement program are fully aware of the public consciousness of motor vehicle accidents and the importance of tying our road programs to safety. In presenting our programs—in demonstrating the need of them—we stress the fact that present day traffic on our obsolete highway systems is a factor contributing greatly to the deaths, injuries and property damage from motor accidents. We mention narrow bridges, sharp curves and steep grades. But, in my opinion, we are missing the boat in not taking more positive steps toward the presentation of our program in terms of what it means in accident reduction.

What will our highway program really do toward safety? Say we propose to spend $100 millions on a modernization program. What may we expect in spared lives, in reduced numbers of injuries and in savings in property damage? What will be the potential accident reduction from the widened bridges? What will be the return from the provision of the limited access express highways as alternatives to the existing, deadly, congestion-clogged highway?

We are planning this program on the basis of detailed traffic analyses and using standards of construction based on years of research in motor vehicle operation. We can readily develop for our individual projects and for our entire program the benefits that will accrue in reduced motor vehicle operating costs and saved time for the motorists. Why can we not forecast the safety values in equally assayable terms? Why must we speak of safety in our program only in general terms rather than in specific numbers of lives, injuries and dollars? The answer, in my opinion, is that we highway engineers have yet to make the same engineering approach to accident evaluations that we have to other planning problems.

When the highway engineer's accident analyses are confounded by a search for a culprit or a principal cause of an accident the end result is opinion, not fact. As highway engineers we are no better off than we would be with no analysis. There have been published reports of such analyses indicating that "not more than 8 per cent of the fatal rural motor vehicle accidents are connected with highway deficiencies. . . . The figure may be as low as 2 per cent, or lower." *Accident Facts* for 1946 pointed out that state reports indicated a highway deficiency in 7 per cent of these fatal accidents. For 1947 the figure was 10 per cent. The inference from these reports must be that removing highway deficiencies will not be of large importance in reducing the hazard in motor travel. This is contrary to the position we take in advocating a large program of highway improvements. These improvements we say will eliminate hazards materially, promote safety, etc.

Limited analyses of the records for specific routes have shown tremendous differences in accident rates. These differences we attribute to highway deficiencies on some routes not existing on others. The Merritt Parkway-Boston Post Road comparison in Connecticut has been widely used; and so, also, have the Arroyo Seco city street comparisons for Los Angeles. These indicate that elimination of deficiencies in our existing road systems will make tremendous reductions in driving hazard and resulting accidents. They justify the safety claims we make for our road modernization program. They are, however, not in line with the reports previously referred to; 2, 7, 8 or 10 per cent of accidents connected with a highway deficiency.

The situation in regard to accident analyses for highway engineering purposes may not be quite as bad as I have made it sound. There are indications that things are looking up. *Traffic Engineering* for August 1948 reports an accident evaluation in Ohio which covered the entire rural state highway system and compared accident records on sections of the system *regardless* of cause. It demonstrated that "physical differences such as character and width of roadway are factors which greatly influence the accident frequency." The report drew this conclusion: "If the accident rate per mile for the entire state system had been the same as that of the prone mileage, Ohio could have expected approximately 123,000 accidents . . . instead of the reported 17,431."

Another cheering note in the accident analysis picture has recently come my way from California. Karl Moskowitz, with the California Division of Highways, has been doing some work with accident records in an attempt to make accident frequency rates for different road sections truly comparable in reflecting the influence of road characteristics. Because traffic density is itself a factor in the creation of hazard, he has proposed a coefficient to be applied to the accident rate which will reduce all records to a 1000 vehicles a day base. His coefficient is 4 over t to the .2 power, where t is the average daily traffic on the road. We in Connecticut are now using this coefficient in some evaluations we are making.

We are now in Connecticut doing a great deal along several lines to make our accident records of value in planning and presenting our highway program. I shall not here go into detail, but we can and do now forecast what the completion of planned improvements on our Interstate Highway System will mean in lives and savings in property damage.

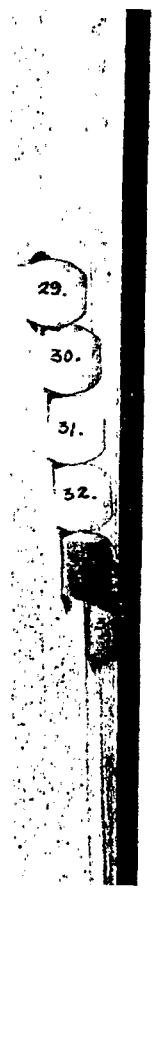
## How Can Rural Location Data Be Improved?

By A. R. PEPPER
Traffic Engineer, Colorado State Highway Department

Rural location data are the key to all sound accident history data and of particular importance to the engineer in determining the physical characteristics of the exact location for future remedial action.

Rural information in the past, probably in the majority of the states, has been on the basis of landmarks, such as intersections, junction points, and highway structures, or large building structures of a commercial





nature. However, other types of markers have been used such as local street names, or even the "little red schoolhouse" or "Farmer Jones' yeller barn." All of us are more or less familiar with types of description such as these which might have originated with the town marshal, who knew the area from "A" to "Z" by all of the pet names, or even by the state trooper or patrolman who has his descriptive names for various locations and in so doing feels these are sufficient since he, himself, is used to these names, and to put down the actual location is perhaps just too much detail for what *he thinks* the final use of same will be.

In the so-called "wide open spaces" of the West, of which I am familiar, there are long stretches of area between actual junction points or topographic landmarks, and the only authentic method used to date in assisting the state highway department in its spotting of these locations is in the use of numbering systems of bridge structures or even culvert headwalls or cattle underpasses in order that the state patrolman might be able to determine the specific accident location.

Even with some of these aids, a great percentage of accident reports are turned in with simply a reference to a nearby town with no reference whatsoever as to whether the accident occurred at a "blank" number of miles from the city limits or from the center of town.

I recently noticed that one western state has been particularly active on the marking of mile posts on all of its main line highways. Of course, these could be utilized to a great extent in determining the actual miles, tenths of miles, hundredths of miles, and feet to determine explicitly, the accident location.

But I imagine, though, that even with this breakdown, there are dozens of persons as well as patrolmen who would fail to indicate the town or towns that might be on the termini points of such a breakdown as this.

Which brings us up to the question—"how can this rural location data be better applied?" Should we try to apply it on the basis of a national system in the interest of accident prevention for obtaining better and more concise data on accidents as befitting the country at large, or should we merely try to set it up on a state-wide basis and then compare notes and verbally exchange ideas as to the progress of development? It seems to me that even in spite of taking the initiative away from the states, some type of marking system might be developed which would be similar in many respects for state level so that it could be adopted as part of the *Manual on* Uniform Traffic Control Devices on a nation-wide basis. True, this would entail a great amount of work by state highway departments, but at least it would establish common ground for rural accident reporting throughout the country for engineering uses, particularly as to accident frequency related to design and these findings could certainly be utilized by the American Association of State Highway Officials Design Committees.

In the State of Colorado we have been fairly successful in maintaining a structure marking series, and these have been utilized by the state patrol as to structure identification and structure names, the majority of structures having a name consistent with rivers, creeks, washes, or railroad by-passes. However, this only takes care of the primary highways because the secondary system, within the boundaries of our state, is rarely posted by the county road agency, as the counties have never been given the incentive or the instruction to perform same, and in the majority of these cases a sheriff's office has covered the accidents and these officers naturally use local names to designate the points.

It then becomes apparent that if such a marking system is to be activated, it should be all-inclusive and cover all rural highways down through the minor county roadways with the full responsibility being maintained by the state through legislative procedures. This first step is necessary for a sound rural accident prevention program. The greater the coverage in a manner which can be utilized by the Accident Records Bureau, the greater the basis for study and, therefore, the greater the comparison for recommendation criteria.

All too often accident reports have to be disregarded or filed under "no location designated" in the files of the bureau because no one in the organization or even in the highway department had the full knowledge to completely identify the location of the accident and such information is absolutely worthless from the engineering standpoint without the exact locality.



Marked junction points are often used as a focal point to plot the scene of an accident on a secondary system, but by the time the patrolman has left this point with his vehicle and has perhaps traversed through a number of right turns, his mileage has been noted to differ from the actual mileage to the extent of 500 feet, and, therefore, to re-check back on the actual point of the accident, he is unable to actually place the exact location, and from the standpoint of the traffic engineer the chance to accurately place the accident has been lost.

This is not necessarily confined to the secondary system, but often appears on the primary system as well, and then the only recourse is to try and decide the location from the design shown on the accident report sketch, pictured by fences, detail landmarks, or other determination points which might have been noticed by the patrolman but then probably only if he were of the aggressive or exacting type.

I do not mean to infer that the enforcement officials of the country have not been conscientious in this effort, but they have been handicapped, I believe, by the fact that highway department officials as well as city officials have not been fully cognizant of the marking program and have expected the enforcement officer to "dig" for the best available information which is at hand in order to determine the accident location.

Perhaps, this is expecting too great a program along with the number of other signs, mileage posts, etc. which have been erected and are necessary to show distances between cities, but actually we should be as basic on this as we claim accident records themselves are, and if these records are going to determine our policy, then we should certainly place the means at hand to obtain the information from them and not sit idly by and say, "that's the job of the enforcement officer, let him do it!"

In the meantime, I believe that at least for the time being, the states should take this task upon themselves to the extent of placing prepared field records in the hands of enforcement officers, accident record bureaus, and other sections within a highway department which might have particular cause to refer to such locations. Preparation of rural locations logs should be the function of the traffic engineer as he is the one most closely associated with accident conditions and localities, and also by his close association with state highway safety councils and other accident prevention groups. A full fledged state highway system plotted with up-to-date rural locations would certainly be a real aid to any state highway department via the traffic engineering division.

Specifically then, I would suggest that structure markings be expanded upon with a possible mile post marking program being attempted later on the basis of the findings of the states which have performed such work. But in any event it certainly could be deemed without hesitation that the consent of the states to such a program would be a direct benefit to the national accident prevention program especially from the engineering approach.

Roadway characteristics and control devices, the physical aspects of driver data in the mass, as well as by the individual approach to driver habits could certainly be intensified by better location data for actual field study.

All of the other items which have been discussed on this panel would certainly benefit in no small manner by first telling the analyst, "*Where* did it happen."

## How Support of National Organizations Can Make Local Programs Click

**(A Symposium)**

*Presiding:* PAUL H. BLAISDELL, Executive Director, National Committee for Traffic Safety, Chicago, Ill.

*Participants:*

**Coordinated Media Support**
JOHN W. GIBBONS, Director, Public Relations, Automotive Safety Foundation, Washington, D. C.

**Support of Organizations at the National Level**
ROBERT H. RICHARDS, Executive Secretary for External Affairs, U. S. Chamber of Commerce, Tulsa, Okla.

**Support of Organizations at the State Level**

MRS. FRANK J. DOWD, State Safety Chairman, Illinois Congress of Parents and Teachers, Winnetka, Ill.

**Support of Organizations at the Local Level**

MRS. MILDRED E. MINSCH, President, Soroptimist Club of Phoenix, Phoenix, Ariz.

**Driver Training as a Special Emphasis Program**

M. R. DARLINGTON, JR., Managing Director, Inter-Industrial Highway Safety Committee, Washington, D. C.

**Problems of National Support for a Specific Monthly Program**

KENNETH HUGGINS, Assistant Director, National Americanism Commission, The American Legion, Indianapolis, Ind.

CHAIRMAN BLAISDELL: The title of this session carries the implication that there is a free flow of program and ideas from national organization offices and leaders down to state and local units. It also suggests that state and local groups, though preserving certain independence, will follow a program policy established by national resolution in a parent national organization.

If such were certain to be the case, and the great interest in traffic safety shown at the national level found its action counterpart in each of the 171,636 state and local units of organizations represented in the National Committee for Traffic Safety, the powerhouse of public opinion, public approval, and public backing which we seek would already be ours.

Unfortunately, there is no automatic stimulant which assures state and local activity when the national organization endorses a traffic safety program. There is not now and probably never will be, automatic adoption of every national program by state and local clubs and associations. The energies of public support are divided among many projects for the public welfare, and much though we may believe in the importance of safe streets and highways, we cannot selfishly assert that juvenile delinquency, child labor, international relations, or better health standards, for example, should not have a fair share of organization interest and support.

I want to remind this audience, as I have many others—that in the 85 national organizations represented in the National Committee for Traffic Safety, aside from a very few professional groups, traffic safety is not the major interest of even one of the support organizations. Yet, we have positive proof that up to 50 per cent of the state and local units play a very active part in traffic safety programs, and well over 85 per cent of them do something for traffic safety each year.

An objective of the National Committee for Traffic Safety as a coordinating agency and clearinghouse for national organizations concerned with highway safety, an objective of the National Safety Council, and a host of other national groups, is to develop a traffic safety support program which is glamorous enough, strong enough, and appealing enough to win even more state and local action.

The traffic safety battle will not be won in national offices or at national congresses or at national conventions.

It will be won on the main streets of America.

The best we can do here today is to show you ways and means of doing a better job in the states and in the communities.

We are assuming today that the term "support" means active public backing of the traffic safety program set forth by state and municipal officials who are charged with the legal responsibility for safe streets and highways. This premise is in accord with the recommendations of the President's Highway Safety Conference, 38 state highway conferences, and several hundred local meetings, which have adapted the technical proposals of the national action program. Support can mean, however, the same active backing for a traffic safety program sponsored by a civic, service or commercial organization, assuming that such a program is in harmony with official needs.

The basic power of this plan is united action, coordinated for strength and efficiency, so that the right hand always knoweth what the left hand doeth.

I have said that the traffic safety program calls for coordination. We can have no support program without the facilities of public information. Herein are contained all the avenues to public safety education.



The use of newspapers, radio stations, outdoor advertising, television, transportation advertising, as a means of developing an informed public is a technique long regarded as essential in traffic safety, but not yet attained on a fully coordinated basis.

When this happy day arrives, we will indeed be getting public support through public information.

**Coordinated Media Support**

MR. GIBBONS: I'm not sure just what "coordination" means. If by "coordinated media support" we mean that the press and the magazines, the news syndicates and the radio networks, and other national media of public information shall carry the same materials at the same time, on a specific subject, nationally, I think it is largely nonsense.

I do not think it is feasible, nor do I think, necessarily, that it is desirable. As a matter of fact, any effort to coordinate media of public information on that basis would, I think, be doomed to failure for a number of reasons:

First, because each avenue of public information will have its own particular interest, its phase of the problem, which, at any given time it will wish to deal with.

Second, there are a large number of problems involved in the subject of highway safety, all of which, during the course of the year, certainly must be dealt with by one agency or another. I think any attempt to straitjacket a medium in that sense would probably lose much more than would immediately be gained by the impact of a large number of publications and media hitting the same subject at the same time.

But there is an even more important reason why I don't think that is what it should mean, and that is because there is no national jurisdiction over the use of motor vehicles. Essentially the highway safety program is a state and community program, and if the information activities are to be —and I use the word fearfully—"coordinated" with the program, it must be done, obviously, on a state and community basis.

In terms of a state or community basis, I believe that public information activities by all media represent nothing more than a useful, essential tool in carrying on an organized program in this field. I don't think that it is an end in itself, and I don't think that it stands by itself. I think that precisely to the extent that the state or the community has an organized public support group, coordinated on an official program, going on together, and to the extent that the program makes full use of the cooperation of public information media, the problem of coordinating them will automatically take care of itself.

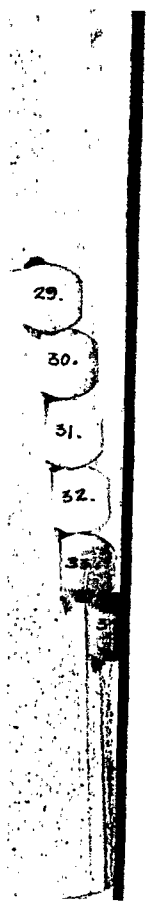
Some of the weaknesses in this area of the program are these:

First, and perhaps most important of all: A singular lack of adequate personnel, men to staff this type of work in the states and in the cities.

The processing of information for newspapers, for radio programs and for other media is also important. It requires a certain amount of technical know-how. Particularly is this true in the radio field where men with backgrounds of training in that field can make a program click; whereas, without them, it very often will be much less effective. There still remains a very large gap in the number of people who are employed either parttime or fulltime for this type of work, as important as it obviously is to this situation. Lack of trained personnel, then, probably is the largest weakness, and one which must be met in each state and community by the organizations which are carrying forward this coordinated program.

A general observation on this subject would be that the public information side of the work is not made an integral part of the total program when it is laid out, or if it is recognized as necessary and essential, there is no adequate provision made in manpower and money in the organization setup to do an effective job in that field. It does take trained manpower, and that is largely lacking, except in a certain few notable cases where excellent jobs are being done.

It should be noted, too, in passing, that there has been a remarkable increase during the past few years in the amount of attention media have given to this subject. The progress reports, year by year, show a remarkable degree of enthusiastic cooperation in many cases by radio stations and statewide networks, regional networks of broadcasters—certainly by newspapers almost 100 per cent. It is true of outdoor advertising and other media as well.



I would not want to leave the suggestion that magazines, national radio networks, and other national or nationwide media do not have a very large contribution to make; they certainly do. At the least they can provide a sort of "ground swell" or "background" of general public interest in the subject, and that should not be overlooked.

There has been a great reluctance on the part of the governmental agencies in the expenditure of funds for the purpose of disseminating facts about the program, for public information work. The past year has seen a definite trend away from that position, and it is noteworthy that the original report of the Committee on Public Information of the President's Congress in 1946 specifically recommended and urged that money be expended for that purpose where necessary by governmental agencies.

### Support of Organizations at the National Level

ROBERT H. RICHARDS: Our safety program for many years has been the outstanding feature of our 32 fields of activity that range in nature from Americanism, aviation, agriculture, clear on down through the alphabet to youth activities—but we find that our safety program is by far the program that has the most participation, and the program that has the best results.

We believe that is due to several factors. The primary thing is good planning and good organization from the top down. We attempt to map out, from year to year and from month to month, a full year's program in advance.

We attempt to plan our programs so that every member or every local safety chairman will have some idea of what is coming up.

Next is the writing of the material and the production of it into some semblance of organized form. We recognize the fact that we are not safety experts by any means, but we believe that we are experts in the field of promotion and selling, because that is our responsibility in the national office. We must sell these programs and these ideas to the local Junior Chambers for them to pick up and take up and promote actively.

Third, we find that a good, well-planned program must have leadership. Our Committee on Public Safety, of course, is all volunteers. These young men throughout the country are in many instances the men who are connected with the safety field as a profession.

We recently came out with a new idea and we feel it is by no means a takeoff or a copy of the splendid program Operation Safety. We do believe this: that if our organization and other national organizations would follow a like pattern, the success of Operation Safety in every community would be guaranteed.

We, of course, readily recognize that so many organizations in a community—Rotary, Kiwanis, Lions, Junior Chamber, the Elks, the American Legion, and so on, present a problem. Of a constant flow of material from their national offices was not coordinated in some degree as to the phase of safety during a particular period, a state of confusion would exist down at the local level.

We believe if other organizations would follow that pattern which is established by Operation Safety—and something we have recently developed—that on the local level there would be some degree of understanding and coordinated effort.

In a new kit, "Avenues for Action on Safety," we have taken the calendar and given each month a particular theme. Nine of our 12 themes are those listed in Operation Safety. We believe the presentation of this kit to the local Junior Chamber of Commerce will make a direct contribution to the success of any safety program on a local level.

We have been tagged as an organization of crazy ideas and crazy stunts. We believe that the best method of putting a program over and making it more effective is to do the unusual. For instance, the JC's down in Marietta, Ohio, not long ago, rigged up two dummies, put them on a street intersection, put a speaker in the dummies, and then connected them to a microphone in a nearby building. They had JC's on the job 12 hours a day. Every violation of traffic laws or pedestrian rules would be noticed by these observers, and it would appear as though the reprimand was coming from one of the dummies.

Other similar gimicks are promoted daily through the Junior Chamber of Commerce. We attempt to attack a problem on a sensible approach, but at the same time



come up with, or dream up some of these "crazy" ideas that are really attracting the attention of the citizens.

Another effective means that we have found for promoting safety on a local level is the writing of material and "dressing it up" with a lot of crazy art work and pictures, and so forth, so that the individual or the committee in charge of safety will have some means of putting the material out. It is just a case of making it attractive so that the reception of it by the local chairman is guaranteed.

These kits, "Avenues for Action" are mailed to our local organizations at least 60 days in advance of the month's promotion. For instance, the December kit is on holiday driving hazards and will be mailed out within the next few days.

We have constantly reiterated the warning to our Junior Chambers that if this program is now in effect, or is being promoted or sponsored by some other organization, they should not attempt to compete with them. We would rather join forces with some other organization and assure its success than set up an entirely different program and compete for the credit.

Our organization is sometimes guilty of bypassing our state organizations. We believe that the local level is where most is accomplished, and we direct our activities to the local chapter.

Our safety program is subsidized by a national concern that makes available to us a grant whereby the cost of producing this material and carrying out the program is not a burden or handicap to our national organization. It might be that other national organizations can follow the same pattern. We find that it is more effective because we have special facilities set up as a result of this grant to carry out this program.

### Support of Organizations at the State Level

MRS. FRANK J. DOWD: Four years ago, when I first took over this work in the Illinois Congress of Parents and Teachers, it seemed to me that constantly I was being asked the question by different locals throu[illegible] the state, "What can we do?"

On my meager budget I could hardly do more than just dream about getting up a safety kit. Then, out of a clear sky, the JC's came to my rescue. It seems that our Illinois JC's had been given a certain sum of money with which to do a safety job and they had delayed slightly in doing it, and they heard that the safety chairman of the Illinois Congress was very anxious to do a safety job that would cost more than her own budget would allow. So the JC's very generously turned over this sum to me with which to work and make up the safety kit.

I finally have the kits all in their envelopes, and most of them addressed, waiting to be mailed to the prospect.

In this kit I, too, have copied from the National Safety Council's Operation Safety kit, but I received their permission, first.

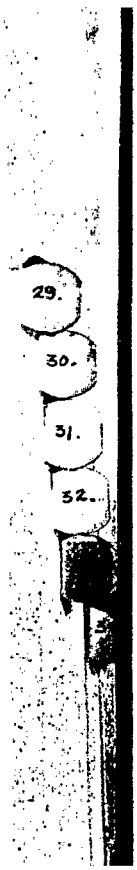
On one side is a planning guide, and on the other side, the materials to use. The planning guide is a matter of several mimeographed sheets, giving an A-B-C program that can be followed by a local unit.

Now, of course, we have various and sundry different types of units here in the State of Illinois. We have an association, for instance, that is sort of a "lone wolf"—only one association in a community, and so we had to set the program up that would fit that type of association. Then, we have a community that perhaps has several associations, which band together into a council. So, we had to set up a program that would fit that particular type. Then, too, we have a community that may have several associations in it, but they haven't formed a council, and so we had to set up a program for that type of association.

I went around to various other organizations, asking for some free material to put into the kit. The American Red Cross gave me a set of their teacher guides which they issue on a monthly basis, each month on a different subject. They divide that into two groups—upper elementary and primary grades. These are suggestions that can be used by teachers in the schools.

Then we have a very effective folder with one of the designs for the 24-sheet outdoor advertising poster, "The Empty Seat."

The Metropolitan Life Insurance Company is putting on an excellent campaign in a little pamphlet, and while this does have to do with home safety, I felt it was not really out of place in a safety kit that was going throughout the state.



Mr. Blaisdell supplied me with copies of "License to Live" and "1910 Driving Skill Isn't Good Enough for Today."

From the Safety Cycle Club of America, I secured a very fine brochure on bicycles, which certainly are in the field of traffic when it comes to our school children.

The kit includes newspaper releases that can be used by the locals by filling in their local names, and so forth; there is also a set of radio scripts that can be used by the locals.

The next problem was how we were to most effectively distribute this kit. First we thought it should be sent out to every association throughout the State of Illinois, to all of our council presidents, to all of our district directors, and to all of our board members. Believe it or not, that would have been a mailing list of 1,700, and that looked a little bit steep.

So a folder was printed, which advertised this kit, explaining what would be in it, and attached to the folder was a return card, addressed to me, so that anyone receiving this folder (and that folder did go out in our June packet to every one of the associations in the state), and having an interest would send the card back to me. Then we knew the kit was going some place where it would really be used.

At the present time, I have almost 500 of those requests. I have arranged for 800 of these kits. When those are used, we will have to start on another program. Those cards have come in from all over the country. I was rather surprised when they first came in from California and from Georgia, and from New Jersey, and wondered how in the world my little folder had traveled so far, until I found that Mr. Blaisdell had sent copies of the folder to all of the persons on his national mailing list. It seems as though we get cooperation all along the line.

I feel that the program has come from the state and is going to prove very effective on the local level.

A second project is in its infancy. It is a safety poster contest. It has been done by other organizations, but we are carrying this program out on a state level here in Illinois.

Of course, we needed sponsoring—financial and otherwise, and General Outdoor Advertising said they would be very glad to join forces with the Illinois Congress and help us promote this safety contest.

Next the Art Directors' Club of Chicago came into the picture and said they would be very glad to help us, to work with us on this poster contest. It seems as if every week someone else comes in and offers help to put across this statewide safety poster contest.

Because this program was going to all of the schools throughout the state, we felt that we should be courteous enough to ask Mr. Vernon Nickell, our Superintendent of Public Instruction in Illinois, if he approved of the contest. He said, "Because of its educational value not only will I give you my word of approval, but I would like very much to have you print my approval of this project in your Illinois Parent-Teacher," which is our monthly magazine that goes to all of the units throughout the state.

Therefore, we have the schools; we have the art directors; we have the sponsoring of General Outdoor, and ourselves, all working together.

The art directors are going to design the medal, the certificate, and the folders that will be sent out. Outdoor Advertising is going to finance whatever expense is entailed in connection with this. The Illinois Congress is going to present it to all of the schools throughout the state.

Each school will be offered the opportunity of competing. There will be a contest in each individual school, and there will be certificates of merit given the winners of the school contest. That will be done on a three-level basis—elementary school, junior high school, and senior high school.

From the individual school the prize winner will come into our PTA district contest. There will be 31 district contests; and in the districts there will be three prizes, which will be medals.

There will be a grand contest for the three winners on the state level, from which General Outdoor will choose one design which they will use in May and June on their 24-sheet boards throughout the State of Illinois. So, it really seems to me a terrific challenge—something of immense interest to school children. If they are going to have to make a poster about traffic safety, they are bound to have to find out something about traffic safety, and we even hope that it may come back into the homes.



### Support of Organizations at the Local Level

MRS. MINSCH: Safety never entered the Soroptimist Club until the last two years. We hope that, with enough recognition from different parts of the country, a national program will be set up. You put 600,000 women together, working for safety, and then you have something!

The Soroptimist Club in Phoenix entered a safety program two years ago, when we found that safety education in Phoenix and Arizona was lagging. We found that safety was not being taught in our schools. That is amazing to many of you who have had safety taught in your schools for years. We are at least 10 or possibly 15 years behind the times.

We had no funds to start with, but through merchant sponsorship, with the permission of the State Board of Education, we got a safety book to the school children, 44,000 copies in one county alone.

This book was used in the classroom by the teachers, and then the children were allowed to take them home, and there they were reviewed by the parents. So we reached both the school and the children in ther homes.

At that particular time we only attempted to make it a one-time program, but since then, numerous requests have come in so that we have followed through each year with the program. We shall continue to do so until we find that it is not necessary to carry on our part of that program any more.

Each woman in our club is a specialist in her own field. When we decided to [illegible] up our state safety program, each [illegible], through her own field, took over a job and I think I can best tell you the kind of job they did by illustrating to you our month of March, 1948, on the Operation Safety program.

In January of this year, the JC's set up a program and asked 44 different civic and service clubs to attend a meeting so they could coordinate some kind of a program for safety in Phoenix. About 17 people showed up at that meeting. It was very discouraging. But they only needed 12 clubs, or 12 associations, to accept the responsibility for the month-to-month program, and 12 did accept the responsibility.

In January, no program went ahead; in February, no program went ahead. In March, which was Child Safety Month, the Soroptimist Club put on a program.

Throughout the entire month there was not a day that you could look any place, in any of the three newspapers, where you would not find an article on safety. The society columns carried articles, as well as the news items, and, believe you me, we really had to make news to convince those editors that they had news to print daily in the paper.

We had altogether 144 articles in the paper. We totaled 17 pictures. That took care of the press coverage, our medium of public support in notifying the public of just what we were doing.

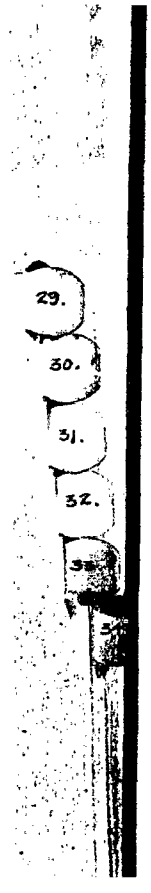
We had four 15-minute radio programs every week. One of the high schools contributed their drama department. They wrote and produced safety plays on the air for us. We had five 15-minute programs per week, not including those that were contributed to us by other organizations. We had 30 spot broadcasts per day, on each of the four stations, for the entire month.

One project we carried out was a street parade in which we dressed 50 different children to represent different traffic accidents. It brought a lot of criticism, pro and con. Some thought we took the gruesome side of it, and some didn't. You can't coordinate everybody's feelings, but I think the good we did with the 50 children outweighed the harm.

Our pictures through the papers, and through one national magazine, on that one parade, have brought results.

We had the various schools dramatize the safety book that the Soroptimist Club put into their hands.

The second major thing we did was to approach one of the traffic court judges. We asked him if he would take care of one item of this campaign for us. We wanted a case made as an example, which would involve school children. There was a driver who went through a school zone at a terrific speed, who, when he was arrested, instead of just being fined or confined to the city jail, was informed that he would



have his choice of the usual fine or an opportunity to meet a crippled child, who was maimed due to a similar type of accident.

This arrest was given a lot of publicity. Our traffic violator did go and visit this little boy. I can tell you, in all honesty, he has become a very good friend of this little fellow, and he visits him weekly.

They interviewed this traffic offender on the radio and asked him just what he thought of his type of sentence. He said he would never forget it as long as he lived. In his opinion, it did him more good than if he had paid his fine or gone to jail for his violation.

We had posters we purchased from the National Safety Council. We distributed them throughout the city; and we met with such fine response that many of the traffic fleet operators called us and asked us for more of these posters.

We had a street contest in which we gave silver dollars to the children. Once a week the rules for the week were posted. If it was bicycle week, or pedestrian week, or whatever it was designated, the rules were printed in the paper, and we notified the school children that they must learn their rules because they would not know when a contest would be held.

The last week of the month we had a street contest with two roving sheriff patrol cars, with silver dollars, and they traveled throughout the city. Naturally the children did not know when or where they would be approached, so they had to keep reviewing the rules for the entire month.

We interviewed on the radio many of the children who had been crippled as a result of traffic accidents; and they gave their full stories.

### Driver Training as a Special Emphasis Program

M. R. DARLINGTON, JR.: After the first President's Highway Safety Conference in 1946, Mr. Pyke Johnson of the Automotive Safety Foundation received a communication from President Truman commending the automotive and allied industries on their interest in helping to make the President's program a success. He also expressed the hope that the automotive and allied industries would continue their work at the state and local level, to urge their own members to do something about accidents.

As a result of this the automobile manufacturers, the National Automobile Dealers Association, and the rubber manufacturers, got together and formed a national committee, which is composed of three representatives from each of those organizations.

The purpose of this national committee is to establish policy to guide the operations. We then set about forming state committees, comprised of dealers and trade association representatives of these groups. The responsibility of the state committee in turn is to organize local groups, and through them our programs flow to the local level.

We outlined a five-point safety program in which high school driver training was listed as the first project, because the automobile dealers have a real interest in this particular problem. I think all of you are familiar with the fact that approximately 2,000,000 boys and girls become of driving age each year.

The dealers of our groups were requested to contact in their states and in their communities the education authorities who have responsibility for driver training in the schools, and offer their cooperation in making available a car to those schools which have a program of driving instruction that is acceptable to the school authorities; and secondly, to those schools which have a trained teacher to offer the subject. We worked in very close cooperation with the National Education Association, through their National Commission on Safety Education; the American Automobile Association; and the Association of Casualty and Surety Companies, in developing our program, since the latter two organizations have been in the field promoting driver training and driver education for many years.

We sent out our materials to those organizations, as well as some other national organizations, for their suggestions. We wanted to be sure that we were not at cross-purposes with other organizations, and showed our desire to cooperate by giving them an opportunity to comment on our materials.

These materials then were sent out in detailed form to our state chairman, who in turn contacted the state dealer association. There is a state automobile dealer association in practically every state in the country, and many of them have local dealer associations who in turn made arrangements, through their local groups and members, for them to cooperate on the basis that I have outlined previously.

We particularly stressed this fact: That driver training sometimes is not an easy thing to put across, for the simple reason that the educators in some instances still do not feel that it is their prime responsibility to teach the subject. Therefore, we urged their cooperation with other groups, and to contact other groups who are active in this field in helping to do the overall job.

As a result, where two years ago one of the big stumbling blocks in the advancement of driver training was the lack of an automobile to give behind-the-wheel instruction, we find that now we have a decided improvement in this condition.

There are some people in the room who operate on the state basis, who have received this cooperation to a very wide degree. I believe it is safe to say now that any school that meets the requirements can count on an automobile for behind-the-wheel instruction. That is a pretty broad statement. I recognized that, but we have had many instances where schools have written to us wanting to know where and how they could get an automobile. So far we haven't had them come back to us and say, "We can't get one."

You folks can play a very important part in this promotion of driver training by helping to sell it to your school authorities, and helping to sell it to the people in your community. It is a project that in some instances has not caught on to the extent that it should, because some people still do not recognize the need.

I would urge you, if you don't have the training in your community, to contact your school authorities; get the PTA behind it; get other service organizations, such as the women's organizations and the service clubs, behind it.

I would like to point out this one fact, as a caution: Our committee does not recommend indefinite loan of an automobile to a school for this purpose, because we believe that the schools should purchase their own cars for driver training, the same as they purchase any other school equipment. But we are perfectly willing, during this interim period, to sell the need for driver training, to have the dealers loan cars for that purpose until it can become established. When that time is, I am not in a position to answer; but I think I can assure you that you will have the support as long as you may need it.

Our Michigan Inter-Industry Highway Safety Committee came upon this particular project, liked it, and immediately put it to use. It is something that supplements very well, I think, and where you do not have driver training in your schools, it can be used quite effectively, also. That is a little agreement that they compiled, called a "man-to-man agreement." This is simply a written agreement between father and son, or it could be between father and daughter. This governs the use of the family car, and in it the teen-ager pledges that for the loan of the family car he in turn agrees to abide by all traffic rules and regulations, and follow the outline of eight specific things herein listed, recognizing that if he does not do this the father has the right to take away the use of that car for whatever period the father deems desirable.

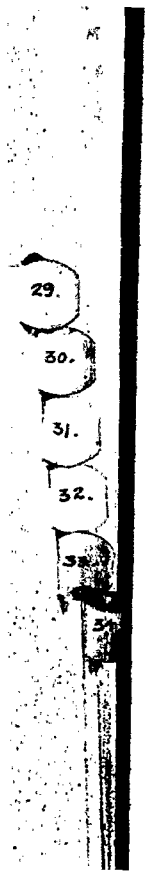


### Problems of National Support for a Specific Monthly Program

KENNETH HUGGINS: Our specific problem is that of local support from volunteers. In planning our sponsorship of the September theme of Operation Safety, our first step was to consider the approach which would be given to the promotion of the September theme, which was Child Safety. When you consider that we have 17,147 Legion Posts scattered throughout the United States, and we must work through the various state headquarters, you will readily see there was quite a problem to overcome.

Our first approach was to attack this particular problem from two angles: First, we utilized all media available to the National Organization, to focus the attention of the individual Legionnaires on the fact that we had assumed the sponsorship of the September theme of Operation Safety. We did this through our national magazine, through the "National Legionnaire," through radio outlets, and through a clip sheet which we use to service approximately 1,500 newspapers.

By doing this, the individual Legionnaires within a given post, who had a specific



interest in safety, would approach the safety chairman or the post commander and ask that he obtain materials or additional information in order to get the sponsorship of this program. These post officials would in turn refer to their department headquarters, either their department adjutant or department safety chairman. We felt that if enough pressure was brought to bear from the "grass roots" level upward to those ineffective department or state safety chairmen, we would have accomplished something.

At the same time, we made announcements direct to the state level as to the purpose of our assuming the sponsorship of the program. We had, truthfully speaking, moderate success with the approach.

In addition to the stimulation of interest on a local level, we somewhat assisted the coordination of effort on a state level, and surprising results were obtained through liaison set up between the Legion and state safety councils.

Insofar as our overall accomplishment on a national level is concerned, I have been attempting to determine the true status. On the first of October I sent a bulletin to each of the states, requesting information and copies of all literature which was distributed in connection with the sponsorship of this given program. I have to date received 15 replies, and from among those replies, the states of Arkansas, Indiana, Kansas, Tennessee, Texas, and California by far surpass the activities of the other states.

In considering the various factors which would be essential to the success of such an undertaking, we of The American Legion must overcome a problem of finance, because to insure the success of the sponsorship of another monthly theme we must be assured that all materials prepared on a national level will be disseminated direct to the posts. That in itself presents a problem. If we could stop at the 17,000 copies of any given brochure, that would be fine. But we must furnish the post commander a copy, the post adjutant a copy, and the post safety chairman a copy, which totals approximately 50,000 copies of any given item which we distribute from the national to the post level.

To overcome this problem I have one suggestion to make, and that would be we coordinate the special interests of selected members of the public support group for the purpose of organizing an Operation Safety promotion from the national level down through the state to the local level, with those interested groups working together all the way to the bottom. Through that we would cover a broader area, and we would, I believe, have a greater participation on a local level.

### *Discussion*

CHAIRMAN BLAISDELL: The suggestion just made for the handling of Operation Safety has already been considered by the National Safety Council's Committee on Public Safety Education, and they are going ahead with the development of a plan which will do the very type of thing which Mr. Huggins has suggested.

FRANK ULISH [Director of Safety Education, State of Iowa]: I would like to speak not as the director of safety education for the State of Iowa, but as state safety director of the Legion for the past six months, and as safety chairman for the Iowa State Teachers.

The Operation Safety idea is fine, but I think there has been a little mistake in making the effort among the Legion and the PTA. The American Legion has their National Convention in August. We are not appointed until September. With the posts we have in Iowa, it is utterly impossible for me to contact the post chairmen or district chairmen, because some are not yet appointed.

I do not believe September is the opportune time to sponsor Operation Safety. I think it is ideal for the PTA because they have all summer to get set for it.

I didn't hear Iowa mentioned in that list, and I suppose Paul and some of the rest of my friends will say, "Why wasn't Iowa mentioned?" I am not offering this as an alibi. I am just saying there has been an error made in the time to get this into operation. Even though the State Fair was on, at the time I did get that, I did sit down and I went on the air at 7:15 and discussed it. Mr. Faber, our public relations man, has carried it through the channels, and he did a fair job.

HAL KENT [Executive Secretary, Racine County Safety Council, Racine, Wisconsin].



There is a good sprinkling of local council managers in this room, and I think it would be unfair to leave the impression with some newcomer that they resented any form of national cooperation or coordination. Any comments or criticisms that have been made, I am sure were intended to be constructive.

Now the question, to Mr. Darlington: In connection with your program, what instruction materials, teacher-training programs, or other aids, are recommended, and through what source are they available?

MR. DARLINGTON: We do not recommend any particular teacher training program. We are not in the business of training teachers. We hope that our groups will, through their efforts, stimulate interest to get that job done; and we in turn will try to help get it done by offering to loan an automobile to those schools that have a sustaining program that is acceptable to them, and a trained teacher.

MR. KENT: What about materials?

MR. DARLINGTON: We have not provided them with any material other than our own, which was checked over with the various organizations. We also sent them a copy of the National Education Association's book on driver training.

We are trying to not take sides in any proposition here about training programs.

MRS. MILDRED McKAY [Cleveland Automobile Club: Cleveland, Ohio]:

I heartily commend the policies that the National Inter-Industry Committee has laid out. The tools, the standards for the presentation of cars to schools, that courses be acceptable, that they have a trained teacher —I think that has been well thought out and is most commendable.

But, has there been some means developed by the committee to get these commendable policies down to the dealer level so that these men who are contacting the schools know something about them?

MR. DARLINGTON: Yes, Mrs. McKay.

Though our policies have been sent to our state groups and dealer associations, as I mentioned earlier, each association or each dealer organization, rather, is in a state, and there are many local dealer associations. I will grant, Mrs. McKay, that maybe some of our dealers—there are 34,000 of them in the United States—have not received that information. We are trying to advise our dealers of these policies both through the association and through the manufacturers.

I can't promise you that an automobile dealer will carry out these things, any more than that a Legionnaire will carry out some of their specific suggestions and programs. It is an educational job, and we are trying our best to make them see that if the driver training standards are not adhered to, the whole program falls down.

H. WOODS (Lehigh Safety Council, Bethlehem, Pennsylvania): How many high schools have been reached and have this behind-the-wheel instruction training program?

MR. DARLINGTON: It would be my estimate that there are probably close to 1,800 schools. Unfortunately, we have no uniform reporting system through the school authorities back to any other one unit, or through organizations to any one unit. It is a guess, pure and simple.

I am amazed at the number of times we get information in our office on a dealer who has loaned a car to a school that we didn't even know was thinking about the program.

MR. WOODS: Your figures would be conservative; there would be more, possibly?

MR. DARLINGTON: I would hope so.

MRS. RALPH CRAIG (State Chairman of Safety, Michigan Congress of Parents and Teachers): I think it might be interesting to the gentleman to know that Michigan has an increase this year of 1,000 per cent in driver training, behind-the-wheel education. We have over 200 schools to date in this program.

C. VIBBERTS (Ohio Traffic Education Association): This is a comment, rather than a question.

I am a little concerned, and have been for some time, with the use of the word "promotion." I am wondering if we should not try very diligently to get away from the use of that word "promotion," as we are in Ohio now. We say, rather, we are cooperating in offering services, rather than promoting them.

CHAIRMAN BLAISDELL: May I answer that comment in part by saying that

some prominent educator, quite recently, admitted openly that no progressive change in the curriculum of American education had occurred since the turn of the century without its being put there by public pressure.

Perhaps we should just let it alone, at "promotion."

N. O. SCHNEIDER (New Jersey State Safety Council): I don't think the impression should be left here that all you need are a trained teacher and the provision of a car and the program can be started.

I think the crux of the entire problem is the fact that you need a scheduling of the program in the school, and you need more funds. I think we need to stress the fact that we have to put across the idea to the schools and to the public. We need more money and more time on the part of the teachers to do a real job of driver education and training. It isn't a question of lack of cars that is holding up the program; it is a lack of time and funds.

CHAIRMAN BLAISDELL: There is, in my recollection, a committee of the National Safety Council, which, a year and a half or two years ago, were pointing out that there were four main problems in the field of driver education and driver training, and now more frequently termed "driving instruction," in the schools. Those were the availability of automobiles, which since the war has begun to be eased; the availability of trained teachers, which I believe has not yet been eased; a place for the program in the curriculum—and educators might be surprised were they to hear from some of the top public support people in the United States, the belief of what might well be dropped out of the curriculum in favor of safety education— and help me out —what was the fourth one? I have missed one.

MR. SCHNEIDER: Financial aid.

CHAIRMAN BLAISDELL: The Panel members have made these suggestions:

First, that absolute direction of subject matter for the media of public information on any nationwide scale is undesirable. The strength lies in adaptation to the needs of a state or a community. Public information is a means to organized public support; alone, it is meaningless—joined with public support, it is a powerful weapon for traffic safety. Its current need is adequate trained personnel, particularly in state and local government.

Second, an essential of a good national organization traffic safety program is a carefully-developed plan, written in terms which laymen will understand and can translate into specific action.

Third, the national program must sell its own units as well as the general public, at the state and local levels. National programs for traffic safety should not compete but should complement and supplement each other. The problem facing a state safety chairman, who so frequently has limited funds available, is that of getting out a practical program which will give local chairmen and committees the A-B-C steps of action; yet, with a modest budget, and the assistance of other organizations, a comprehensive plan can be assembled.

Fourth, of primary importance at the local level is active cooperation with officials, and mutual assistance awaits public support groups with the courts, the schools, and the police. An active public-support organization need not confine its work to the promotion of traffic safety news; it can make that news.

Fifth, support organizations can make a marked contribution to highway safety by selling officials and the public on the importance of safety education and driving instruction in our school systems.

Sixth, even the "dead wood" found probably in all state organizations will finally succumb to the combined pressure of local units pushing from below and national organizations pushing from above.

## Public Support for Police

By MORRIS J. CARTER

*Assistant Director, Indiana Traffic Safety Commission, Indianapolis, Ind.*

As a former police officer and police administrator, I was confronted with the practical problem of developing public support for the police department in a city of 60,000 population. For the past year, in my work with the Indiana Traffic Safety Commission, I have been faced with the same problem on a statewide basis.



The most striking fact that I have observed in the work on a city level and on a state level is the similarity of the two. Of course, the area to be covered is different, but generally, there the difference ends. The same fundamental principles hold true under both conditions.

Before talking about the principles which have proved effective in developing public support for the police, I feel that we should spend a moment on the question—*"What do we mean by public support?"*

What is it? How does it operate? Why bother about trying to develop it?

If I were to ask each of you to give me a definition of public support, the chances are good that no two definitions would be alike. The phrase has many meanings, depending on the interests and circumstances surrounding its use. Our first job, then, is to try to arrive at a meeting of minds as to a general understanding of the term —public support.

A year or so ago, the National Committee for Traffic Safety conducted a public opinion poll on various questions dealing with traffic safety. This poll was conducted on a scientific basis and covered the entire nation. One of the questions asked dealt with police efforts to enforce traffic laws. Over two-thirds of the persons answering this question indicated that they favored a policy of more rigid enforcement by our police agencies.

This is certainly a favorable reaction to the work of police, but neither you nor I would be naive enough to feel that such a result means that over two-thirds of the American people are now giving full support to police traffic enforcement efforts. If you do have such beliefs, you have never had to face a group of irate citizens who have just been given tickets in the recent drive on speeders.

This simple example serves to illustrate one of the most important factors regarding public support, and how it differs from public opinion. This difference is enormous and must be fully realized by every police administrator interested in the problem. Public opinion is the conglomerate opinion of the general public toward a certain problem, person, organization or issue. Public support involves the same fundamentals but also implies an additional factor involving active interest.

I am of the opinion that you must, in solving a problem in your city or state, make a careful study of the factors involved. Determine the people who will be most interested in assisting in correcting the problem and make a careful study of what organizations might be affected and would benefit from any results that might be obtained.

After considering and coming to your conclusion on this problem, you should then be equipped to muster the necessary public support.

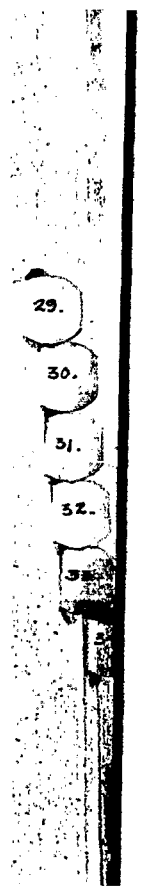
I recall a mid-western community in 1945 which had a serious pedestrian problem. Eighty per cent of their fatal accidents had been pedestrians. The chief and his department immediately started an enforcement program.

The city had a pedestrian ordinance, but it had never been enforced. Officers were assigned to the busiest intersections at the peak traffic period. They were instructed to warn pedestrians to walk with the signal and at times it was necessary for the officer to blow his whistle, signaling pedestrians to stop. After a few days this became very unpopular. People resented the embarrassment of having a whistle blown at them.

The chief, realizing that a mistake had been made, went to the local Junior Chamber of Commerce with his problem. The Jaycees had appointed a safety committee which had never functioned. They were eager to assist and gave him their utmost co-operation. A vigorous campaign was started—posters, parades, film trailers, safety talks to civic groups and schools.

With this type of support the attitude changed to the reverse, and citizens started criticizing people who refused to walk with the signals. This city experienced a decided decrease in pedestrian accidents the following year.

Practically every city and town in the nation, with the increased volume of traffic, is now becoming plagued with a serious parking problem. There are many differences of opinion with regard to who is responsible for this situation. Some say local government; some say the merchant; others say, "Let local private interest take care of the parking."



To me this is the problem of all for it concerns every individual in the community. Many cities and towns have made great strides in alleviating this problem, and I feel safe in saying that this progress could not have been obtained had not the proper ground work for public support been laid.

In every community where parking facilities are inadequate the police department is severely criticized because of this inadequacy.

There are ordinarily many violations for double parking, parking in restricted zones, and continuous flow of vehicles around certain areas attempting to pick up persons on shopping missions. This naturally bears the appearance of a breakdown of enforcement in the police department, and much criticism is usually directed at them.

As I have stated before, this is not the problem of any one person or organization but of many, and the combined efforts of all will be necessary to reach an agreeable solution.

The lack of parking facilities is, by its nature, of great interest to merchants and professional men. The police administrator and his assistants should, through their records of accidents, arrests, warnings and traffic counts, show these merchants, through their own organizations, what the police are doing to correct a bad situation. By the police showing honest, impartial and sincere effort the merchants can do nothing but give the utmost co-operation possible by asking their employees to use the transportation system in coming to and from work, by acquiring private parking lots, and by giving support to the local government for funds to obtain municipal parking lots.

I have cited only two examples, but I am of the opinion that any time a police department is faced with a difficult problem, it can, by a careful survey, find some individual, or organization that will have a particular interest and will actively participate.

I would like to reiterate that in my way of thinking there are four definite points you should carry out to gain the public approval and support of your plan.

1. Show from all available records and statistics the seriousness of your problem.
2. Give detailed account of how you and your department through an honest and sincere effort have tried to solve this problem.
3. Present a detailed plan of the program you with to conduct, and how they can assist in its ultimate success.
4. Show benefits the individuals or organizations will derive from their support to the program.

In the language of traffic safety, no phrase has been more misconstrued than the term—public support. Whenever we do not get something we have asked for; whenever the city council or state legislature cuts our budget; whenever our accident rate skyrockets—we are prone to blame it on a lack of public support. So often, we hear police administrators say, "We could have licked this or that problem, if we had received the support of the public." Yes, I fear that public support has become, in many cases, a convenient alibi for our own weaknesses or for our willingness to make a factual approach to a difficult problem.

As police officers and administrators, we should consider the development of public support as a definite part of our work. We should overlook no opportunity to realize the values which effective public support can offer. I sincerely feel that no other method exists which offers more to the profession of law enforcement than can be realized through the media of public support.

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## Public Support for Police

By DAN HOLLINGSWORTH
Manager, Oklahoma City Safety Council

It is a little disturbing for a former policeman, who is now in community safety council work, to talk on the topic, "Public Support For Police." One is torn between two desires: first, to talk about some past accomplishments and activity in the police field; and second, to talk about what a safety council is doing and can do in building public support for the police.



A short time ago I was assigned by my Board of Trustees, to serve as Course Director of a Police Short Course at the University of Oklahoma, at Norman, Oklahoma. Among the 35 instructors appearing before this group was a small-town newspaper owner and publisher. He was assigned to speak on the subject, "Public Relations for Police Departments." He opened his talk by saying, "I don't know why I was given 50 minutes to talk on this subject, because from my viewpoint, we could dispose of it in just a very few minutes, because to me, public relations, sound public relations for police departments, is simply, 'Doing a good job, then telling your people about it'."

This newspaper man went on to tell these police officers, who ranged in rank from an assistant chief, down to a 10-day old rookie, of ways to place themselves in a more favorable light with their people, talking about the use of radio, public appearances, exhibits, individual contacts, and the like. His primary emphasis was on the use of the press, and he offered several sound suggestions on how to tell the people the police story.

This newspaper man said that if he were asked to criticize the efforts of police agencies to put themselves in a better light with their people, he would tell them they were "missing many bets," and failed in many cases to do "what comes naturally"; that generally, police departments depended too much upon the press, and in many cases, failed to carry through and take advantage of the natural course. He said there was too much "We're going to do" talk, and not enough "We've done" talk.

So rather than talk about what a police department could do, or what a safety council could do in the field of public support, may I provoke your thinking on these questions, *"Are you missing any bets?" "Are you doing what comes naturally in building public support for your department?" "Have you failed to carry through?"*

I have been a policeman for a long time. I know policemen from coast to coast. I would try to convince you that I am just a normal person suffering from no more than normal fears; yet, *I am afraid of policemen.* It scares me to have a policeman pull me over to the curb. Of course, when I recognize this policeman as a man I had in police training school in 1940, and he tells me they have a new baby over at their house and wants us to come by and see the new arrival, I swallow my heart, sigh, and relax.

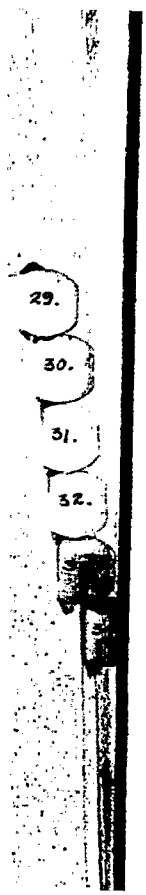
Many, many people have this same reaction, enough of them to warrant our doing something about it. Psychologists tell us that fears can be overcome.

*Can the fear of policemen be corrected?* We are told that a child is born with two natural fears, one of falling, and the other of loud noises. The term, "Be quiet, or I'll have that policeman put you in jail," probably rates as the beginning of one of a child's earliest developed fears. In the first police training school I attended some twenty years ago, this was pointed out as one of the problems in the police public support field. We have been pointing it out as a problem for all these years. What are we going to do about it? Are we going to spend another 20 years pointing to it as a problem, or are we going to do something about it?

I have heard a good many people speak favorably of the police in my community and other communities, but the best sales talk I have ever heard on a policeman and his department came from a five and a half year old boy who had just met his first policeman. Honestly, you would have marveled if you could have heard this kindergarten boy tell about Bill, the policeman, if you could have seen the expression on his face as he told us what a swell guy he thought Bill was. This kid was really doing a public support job for this policeman and his department. Why? Because Bill was friendly, he took the time to talk to this boy.

Simple, isn't it? Elementary. A squad car stopped at this school, and a young policeman walked across the schoolground. He stopped, sat down on his haunches, smiled, laughed, talked, and patted tow heads. Wasting time, *No*—he was building support for his police department, strong support; so strong, so solid that it will offset the adverse publicity that is just as sure to come as death and taxes.

It doesn't make too much difference what your policeman said to Mama and Papa,



or how many times you have arrested them, if when they get home at night, their children tell them what nice people the policemen are, and if you will carry on this kind of approach to the boys and girls in your community in sufficient quantity, you will have a lot of those sales talks being presented to Papas and Mamas over the breakfast table, in the back-yard, and at nighty-night time. You will have the greatest, the most natural sales routine in existence if you'll only use it.

I wonder how many police administrators would agree that these informal visits with kids in the schools, in the parks, on the curbs; just light talk, just friendly visits, probably will pay you as much in dividends in the public support program, as your formal planned appearances before kiddie groups. And I wonder if you agree that this would do as much to correct the fear of policemen as anything else.

I would like to sell you men on conducting an experiment in the adult field. Take one of your men on fixed post duty and sell him on the idea of smiling at people and waving to them as they pass by his post, rather than blowing his whistle so harshly and standing there with a look on his face which implies, "You'd better behave." I can assure you if you will try this friendly attitude, that you will be agreeably surprised at the reaction of the passersby. The first few days, people won't pay any attention to your policeman, but soon they will start smiling and waving back, and a little later saying, "Hi, Bill," and Bill won't have to tell them his name. They'll find out, because this policeman, by his friendly, naturally smooth operations, is in effect, saying to the people, "I'm here to help you if you need me. I'm not out here to watch you until you make a mistake, and then grab you."

Showmanship, Yes. Flag-waving, Yes. But awfully important in correcting fears of policemen in great big grown-up people. Of course, there's a catch to it. If this is the only policeman in your town doing this, the usual attitude of the other men in town will bring about complaints on them.

Generally speaking, I have found that police are not prone to use showmanship. Of course, they put on exhibits at fairs and school carnivals. They hold open house. The quartet or the glee club goes out and sings, but to reduce it to cases, many departments are "missing some bets," because they fail to play to their audience. And in some cases, they are deliberately, though unintentionally, offending their audiences.

The police have taken many good lessons from the legal profession. They teach us about laws, and how to handle evidence and preserve it and present it, and many other items of a legal nature. We can very well take another lesson from the legal profession in an entirely different direction. It was Clarence Darrow who said, "The skillful lawyer does not hunt for intelligence in the jury box. He knows that all beings act from emotions and instincts, and that reason is not a motive factor. The average juror's intellect can always furnish very good reason for following his instincts and emotion's." Someone has said, "The heart has many reasons, which reason never knows." Here is a sound lesson in handling your people in order to get a better reaction.

In the advertising and sales promotion field, we hear such statements as "The days of the Wooden Indian are over, and we are living in a day of neon lights," "We don't use stairways for our customers, we now have escalators, and elevators."

When a murder is committed in your town or a store is burglarized, your public realizes that certain Wooden Indian-Stairway tactics must be used, and I for one believe your public goes along with you in these tactics.

But, out here on the streets this afternoon, a child is smeared all over the street by a car. This is the signal for your men to go modern, to pitch the Wooden Indian in the creek, to turn on the neon lights, because you are in the show business. Your men are on the stage, the curtain is up, and the lights are on, and those people standing over there on the curb looking over your shoulder are your audience, and the box office receipts in this case are public support for you and your department. And in this case as in many other cases, you are dealing with an audience that thinks and reasons with its heart.

I'm afraid that some policemen make this audience mad. Why make them mad? Handle them carefully. Act your part on that stage in such a manner that you will make them cry. Play your part so well that while they dry their tears with one



hand, they will mentally with the other hand reach over and pat that policeman on the back, and say of him, "He's a nice boy. He knows his business. He doesn't have ice water in his veins. I'd like to have that man handle my case in the event such a tragedy should happen to some member of my family. He is human."

In this kind of show business, you don't use lines, stage directions and prompters. The curtain doesn't go up tonight at 8:30. The show may go on at any time, and the only prompting and directions your men need are to be kind, sympathetic, understanding, honest, and sincere.

As a police administrator, you have a good many audiences to consider. Not the least of these is a very small audience, unheard, unseen, and unsung—but a most important audience to you. They know you very, very well. I wonder how many police chiefs here today know this audience of yours. They are the wives of your policemen. They are as important to your public support program as any other group of a like size. Because, to the P.T.A., to the Sunday School, the butcher, the folks next door, and to many others, they are a much higher authority on police matters, police policies, and police intent than you are. Regardless of what you say to your people, through the press and radio, it will in many cases, be interpreted to these people by the wives of your policemen. Police department bulletins, house organs, and other police publications are literally devoured by this audience.

Are you missing any bets here?

Were I a police administrator, I think I would figure out some way, some way to keep from violating organization rules, and keep my city councilmen advised of the plans, progress, and problems of my department. They are another very important audience for you to consider. They are interested in what you are doing. They want and need the details of your operations.

Has this audience heard your story?

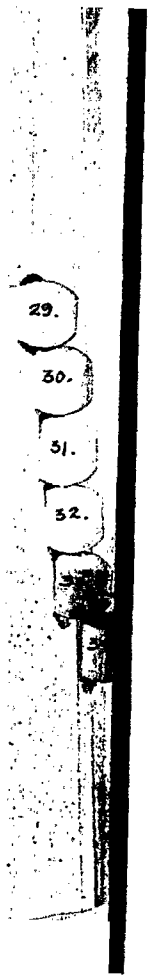
It is encouraging to note that courts are taking advantage of their audiences by passing out printed leaflets to the defendants present in their courtrooms, telling them what they can do and what they cannot do, and informing them of their rights in court. An excellent selling job is being done in some cities by the courts, but they are selling the court, and not necessarily the police. After all, your men brought them into court, so you are entitled to have your say to them.

Are you playing to this audience? If you are planning to, may I suggest that you don't go back home and have one of your boys write up a story and mimeograph it and pass it out to these people in your courtroom. Do this—go to the Sales Executive Club in your city, tell them you need some help. Explain to them that here is an audience which your men gave admission tickets to, and that you want to tell your story. See if they won't help you. I can't speak for these men. I don't belong to their organization, but if they are as helpful in your town as they are in some other towns, I think you will be surprised, agreeably so, at the help they will give you. My guess is that they will do a sales promotion job for you which would cost a private firm a sizeable fee. Won't you go see them?

Being up early and out late will make friends for your department. I realize the chief can't do all this being up early and out late. But someone of the high command can. Early in the morning, people, lots of them, want information on road conditions, and weather problems. In every radio station in your town, newscasters are itching for sources of news, and looking for someone to quote. You have quick access to all this information, and the newscasters of the radio stations will do you a good job. You will profit from it, your people will follow it, and your radio people will like you all the more for doing it.

If, back in your town one night this winter, you have 5,000 people in an auditorium attending a function, and just before this group gets ready to go home, one of your bridges ices over—the man in charge of the program would like to tell this group about this condition, and he would like to quote someone in authority from the police department. It will save you accidents, it is a good service, and the people will love you for it. Such announcements offset your necessary negative activities.

I was in a town in Texas a while back, and talking with a policeman, a boy I went through high school with. He was telling me about a case of trouble that was developing in his department, and I said to him, "Why don't you tell your chief this?" He



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I was in a town in Texas a while back, and talking with a policeman, a boy I went through high school with. He was telling me about a case of trouble that was developing in his department, and I said to him, "Why don't you tell your chief this?" He

said, "I couldn't do that. He would get mad at me."

Well, you know, we plan for strikes and crowds, and all sorts of trouble. Why not plan for complaints? Make it easy for complaints to get to your office, not only from the outside, but from inside as well. I hope you will agree that it is an important part of this public support program, because your public support program in the final analysis, its success or failure is made up of all of the incidents and of all the contacts made by your policemen, both on and off duty. There are many things that would justify all of us agreeing that police business is different, different from any other kind of business, but actually, it isn't, because we have people dealing with people. As long as people deal with people, we are going to have misunderstandings and complaints. The proper handling of them is an important part of your public support job.

Someone has said, "Of all my wife's relations, I like *myself* the best." If we are to succeed in the police field of getting ourselves closer to our people and our people closer to us, we *must* recognize this simple philosophy, and deal our cards accordingly. A man who complains of police handling may be *just another sorehead*, but to himself, he is the most important person living. Treat him as a V.I.P.—if you will, he'll forget *about his complaint.*

As a safety council man, going out and bidding for radio time, we run into a lot of competition. We are competing with the Boy Scouts, and the Armed Services Recruiting programs. We find Polio and Heart Disease pushing us off the air. It is a bit amazing to find no competition from the police. I honestly believe that if you will dig into it, you will find there are as many opportunities for sound radio publicity in the crime prevention field as there exists in the accident prevention field. Talk to your radio station people—get the name of your department used in a positive manner.

Policemen have a good product to sell. The uniform you wear represents many things to your people. It represents freedom from fear and anxiety. It says to people, "You can go away and leave your home for weeks at a time and not worry about it." "Your kids can walk to school and have no fear of being molested." It says many positive things, but it also reminds people of negative things. That uniform says that I can't park in front of my building. It says I can only drive so fast. It constantly reminds me of the things I can't do, and unless you remind me of these positive, good things, I may forget about them.

You not only have a good product to sell, it is easy to sell, and you have a running start on the competition, because I sincerely believe that the average American citizen wants to like policemen. All you need to do to get him on your side is to relax and meet him half way. Then encourage him a little by gentlemanly treatment. Soon, he is sold.

When you have a service, a product, that is as honest, and as essential, and as desired, as protection for a man's family and his home, you can't fly too many flags, you can't blow too many bugles, you can't use too much showmanship, in selling it to the people that want it and need it.

All you need to do is to keep it honest, *keep it sincere*, keep it simple, and keep it going.

*Are you missing any bets?*

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# Planned Enforcement

## (A Panel Discussion)

*Discussion Leader:* LESTER J. DIVINE, Chief of Police, Oakland, Calif.

*Participants:*

INSPECTOR C. G. CONNER, Texas Highway Patrol, Austin, Tex.

INSPECTOR BERNARD J. SCHMIDT, Police Department, Baltimore, Md.

STAFF SERGEANT CORNELIUS F. VAN BLANKENSTEYN, Michigan State Police, Lansing, Mich.

OFFICER JOHN MAIL, Head, Department of Education, Traffic Division, Chicago Police Department, Chicago, Ill.

CAPTAIN J. PAUL SHIVELY, *Captain of* Traffic, Police Department, Lincoln, Neb.



CHAIRMAN DIVINE: We from California are a little hard put to discuss the things we do in California. It is true that Oakland has checked the toll. Last year we had the lowest fatality rate in the 27 year history of the city. That to me is *significant* in that *it* indicates that planned enforcement does work; that an all-around public education program will work; and those are the things we are continually trying to do in our city.

Specifically I think this matter of planned enforcement is so important that it affects every other phase of the program; and to take an hour or so to discuss the subject of planned enforcement only just touches the edge.

I also feel that most of these faces are faces I see year in and year out attending the Council's meeting. I believe that we, as *professional men*, are making a mistake in not spreading the gospel to our brothers in other cities and towns.

The 1947 Traffic Safety Contest indicates that the police are not using the principles of selective enforcement. In the "Guide to Action" it stated that as high as 42 per cent of the largest cities in this nation are not making use of accident records for analytical and selective enforcement policy. And strange to say, our smaller cities have a percentage that ranged as high, I believe, as 96 per cent.

I know that we are all familiar with *selective enforcement* but I believe the Police Committee should carry the gospel to many of our brothers in other cities and towns.

Planned enforcement results from a complete awareness on the part of the traffic administrator of the desirability of selective enforcement. Accident investigation and accident record analysis are not only important; they are absolutely essential. So, I believe it is a "must" that traffic administrators recognize this and maintain adequate records and analytical services, and also investigate all traffic accidents.

Every stable organization in this country bases its approach to the future upon its records, and the police must do likewise if they are going to accomplish a good job.

To begin our discussion, Inspector Conner will give us some up-to-the-minute ideas of enforcement planning techniques from the *state* angle.

INSPECTOR C. G. CONNER: A few years ago, when we began the attempt to improve our enforcement planning and develop some new techniques, we encountered a total lack of information. There were no studies, sound formula, or rules to follow. Certainly some public safety men were around; some work had been done—but we were not satisfied that that work was sufficient for us in Texas.

I should like to tell you about what we have tried to do about that in the Texas Highway Patrol.

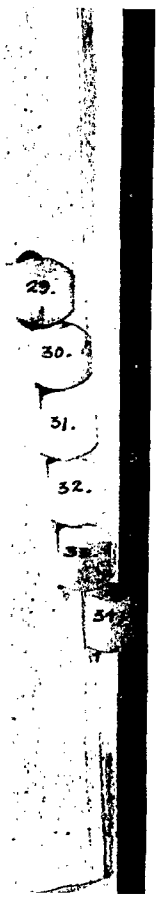
Basically, our traffic accident problem in Texas is a rural problem. Last year, we killed 1,997 people on our Texas streets and highways; 1,549 of those were killed on rural roads; and 448 in municipalities of over 2,500 population.

We will have, at the end of our expansion program, 450 highway patrolmen, with 30,000 miles of state-maintained highway and 100,000 miles of county road to cover. That is mighty little butter to spread over an awful lot of bread. We could not hope *to have an effective enforcement program* unless we could utilize what manpower and equipment we have in the most effective *manner possible*, so we sat down and said, "What will we have to have to do a good job?"

*First of all, we recognize that* we must have the basic essential data. We must have accident records; we must have enforcement records; *traffic flow*; and an accurate record of other factors affecting that problem.

Second, we must have some basis for an equitable and proportionate assignment of manpower. We couldn't even find that basis. Then, we need a tabulation—an analytical agency for our basic data.

We decided that interpretations and assignments and the pushing of the entire planning program must be placed high in the chain of command. Even though there might exist little jealousy in our own department, we realized that the program would be more effective if it were tied high in the chain of command.



Then, we believed, there must be some simple vehicle for the transmittal and interpretation of that information to field supervisors. We found in the field of enforcement planning, cumbersome vehicles, devices, sheets and various other methods, that simply wouldn't work. It was not flexible enough.

Of course, the accident records, enforcement records, and so forth, take care of themselves. They are basic; but uniform techniques had been worked out for a method of handling them a long time ago. We did decide that there was no equitable basis available at the present time in any publication for the assignment of manpower on a state basis in a state as large and with as many complex problems as ours.

With some experimentation and study, we finally arrived at the method of assignment of manpower that we are using today. We took seven factors that we believed fitted the problem in the traffic accident category. They are as follows:

No. 1. A three-year average of rural fatal accidents.
No. 2. Rural vehicle miles traveled.
No. 3. Rural population.
No. 4. Urban population.
No. 5. Number of registered vehicles.
No. 6. Rural highway mileage.
No. 7. The land area in that designated district.

We weighted those seven factors as follows: the accident record, 50 per cent; rural vehicle miles traveled, 20 per cent; rural population, 10 per cent; urban population, 5 per cent; registered vehicles, 5 per cent; rural highway mileage, 5 per cent; and rural land area, 5 per cent.

For our basic geographical division we chose the county since it was already set up—254 of them in Texas. A simple mathematical computation allowed us to arrive at the proportionate amount of the traffic accident problem that reposed in any county.

For administrative purposes, the Texas Highway Patrol is divided into 14 districts or divisions. We are planning, at the end of our expansion program, to have Texas fairly equally divided into 14 parts; each of those 14 parts containing its proportionate share of this traffic accident problem on the basis of the formula we devised.

That means that some districts will be comprised of very few counties, while other districts, sparsely populated, with a low accident record, will contain many, many counties. The land area and highway mileage, however, take care of some of that. That was done for administrative purposes.

Then, within the district we divided the manpower. We have 450 men available. They were divided as nearly as possible, into 14 equal groups; and then, within that district, patrol areas were assigned on the basis of that formula.

We believe this system has been sold to our men. They feel that there is an equitable distribution of work. The comparative records mean something because the responsibility is equal between patrol units, between patrol districts, and can be used up to the state level.

I want to tell you about the vehicle that can be used for transmitting the information gained from master records and enforcement records to our field administrators in order to guide their patrol assignment.

As I told you, we found nothing suitable. So, we devised something by making changes in some older, more cumbersome forms.

We use what we call our Rural Accident and Enforcement Data Sheet. That sheet seeks to study the traffic accident problem from six standpoints. The sheet itself designates the location. I can use that sheet for a study of the whole experience in one county, or for a hundred yards of highway in a county, or for a whole patrol district, patrol area, or for the entire state.

We study accidents by violations; by hour of occurrence; by day of occurrence; by residence of driver; and the percentage of accidents investigated. That gets back to the where, when, why, and who.

I have seen the greatest deficiency occur in a planned enforcement program because of lack of correlation between enforcement efforts, and I have also seen the execution of the program made to conform and correlate with the plan. It is very simple through the use of spot maps, accident summaries, and so forth, to discover what is the problem.

Any intelligent administrator can make clearcut assignments, but there must be some technique or some device to check whether or not the program is being carried out, and whether the arrest effort or the enforcement effort by men in the field correlates with the accident experience. We believe we have made that check in the Rural Accident and Enforcement Data Sheet, through the use of four simple columns.



Column 1 lists accidents in any table—if it is violations, we know the number of accidents caused by each of the hazards. If it is the day, we know the number of accidents on Monday, Tuesday, and so on, down in the other tables.

Alongside of that, we have the number of convictions for that violation, or for that day, against the type of vehicle, of whichever table we may be studying.

Numbers mean very little; so in the other two columns we have reduced those two figures to percentages. In other words, if we are studying violations, and I find that "driving while intoxicated" is responsible for 17 accidents in any given area that I am studying on this sheet, I have in a vertical column right by it the percentage of arrests made by the Texas Highway Patrol in that same area against that violation. If it is less than 17, I can hold that patrol unit responsible for that poor correlation.

We all know the technique of enforcement planning—simply finding out where, when, why, who, and those other questions, and taking the available manpower and equipment that we have at hand and assigning it in the most effective manner possible.

Too often, I feel, that simple devices for bringing the top-level planning down into the hands of the officer actually working the patrol area are remote. We feel that in this "scientific development of manpower," and then utilization of a simple vehicle for transmitting the problem to the administrator and to the patrolman working the area, where he can correlate his effort with the experience, and where the administrative officer can have a qualitative and quantitative analysis of the enforcement effort out there, brings our ideal of enforcement planning much nearer to realization.

CHAIRMAN DIVINE: We now call on Inspector Bernard Schmidt, who is a traffic engineer as well as a policeman, to give us the relationship of education and engineering through a planned enforcement program.

INSPECTOR BERNARD SCHMIDT: The development of a comprehensive traffic control and safety program must be on a realistic and factual basis. Where authority and responsibilities are divided between several and distinct agencies, the closest co-operation and co-ordination must be maintained. There should be complete understanding and agreement as to what the problem is; how and what must or can be done to find the solution. It is essential that remedies or corrective measures to be applied be within the limitations or authority of the individual or agency accepting the responsibility for a particular part of the program.

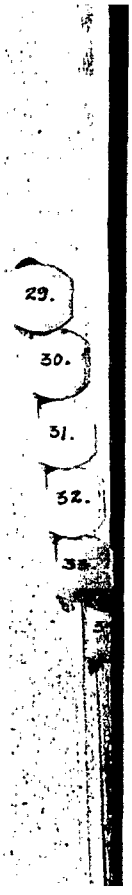
There can be no program unless all three "E's" are an integral part of the program. The question is: How can relationships be established in the administration of the three "E's" that will assure a successful program? I would like to offer a few simple and practical suggestions for discussion which might prove helpful.

*Legislation*—No regulation should be proposed or adopted unless there is complete agreement that it is needed and enforceable. Police departments should not be called upon to enforce regulations that are unreasonable or ridiculous.

When new parking regulations are adopted, before active enforcement, they should be properly publicized. The streets should be adequately posted with uniform and legible signs so that there can be no misunderstanding as to their meaning. The enforcement should be consistent and regular, not discriminatory or periodical. Before and after studies should be made so that we may determine whether or not the regulations are adequate to meet the needs.

In one city studies indicated that a normal fine did not prove a sufficient deterrent to offenders. Later, a much higher fine was adopted with a graduated increase for repeat offenders. While conditions improved, it was still not a remedy. Thereafter the most practical solution was found to be the "impounding" of such cars, together with higher fines and impounding fees.

Incidentally, similar measures have been tried in other jurisdictions but because of



adverse public reaction they have been discontinued. As a suggestion, where such measures are adopted, the parking signs should inform the public of the impounding provisions of the law. The "pound" for the storage of cars should be centrally located so as not to cause unnecessary or arbitrary inconvenience to the violators. The best available equipment should be secured and the personnel especially trained for this work.

*Mechanical Controls of Traffic*—It has long been recognized that mechanical controls of traffic are more efficient and economical than the stationing of officers at control points. Police personnel can be utilized to greater advantages in other functions.

Nevertheless, the mere installation of mechanical controls does not relieve the police department of certain responsibilities. At signalized intersections at certain times of the day, week or seasons of the year, traffic signals need the assistance of an officer.

Traffic signals require an accurate factual study of the conditions, if their installation is to justify the cost. In many instances where signals have been installed without the necessary factual study, the results have been serious. They increase rather than decrease congestion and create potential accident hazards rather than eliminate them.

The proper timing of traffic signals often depends on the most thorough traffic engineering studies and intricate and costly mechanical devices. Where officers are stationed to supplement signals, care should be taken as to the manner in which this is done. For example, if the officer turns the light out or operates the control manually, many disadvantages may result. By the use of too long a cycle, traffic would tie up in either direction for too long a period per cycle. It is practically impossible for traffic officers on either side of the intersection in question to co-ordinate their efforts with the traffic officer or signal at the intersection between. On the other hand, where the signal is a part of a co-ordinated system, the officer can perform a real job by preventing blocking of the intersection. Police officers should be alert to report mechanical failures of traffic signals so that the trouble may be corrected immediately.

During inclement weather, when streets and highways are slippery, police officers should observe whether the operation of a traffic signal creates actual or potential accident hazards. A very excellent idea has been adopted by some cities in the placing of sand boxes or other compounds at signalized intersections for emergency use during such times. It prevents or reduces the accident rate and keeps the highways open.

*Bus Stops*—One of the advantages of free wheel transit vehicles over fixed wheel vehicles is their greater flexibility. By picking up or discharging passengers at the curb, a safer and more expeditious movement of traffic can be realized. However, unless the vehicle pulls to the curb, the advantages are nullified. Without discussing the merits of "near-side" vs. "far-side," "mid-block" or a combination of such stops, one thing is essential and that is that bus stops be kept clear of parked vehicles. This calls for strict enforcement on the part of the police and for adequate marking of such stops by the traffic engineer. One, without the other, cannot be effective. Also, it is essential that transit vehicle operators be compelled to pull to the curb at such designated zones. Studies have indicated that where operators fail to pull to the curb, the cause may be due to physical characteristics of the intersection such as, overhanging trees, curb alignments, etc. Considerable improvement may be effectuated by simple engineering improvements such as cutting the curb back for turning movements, etc.

*Signs and Markings*—Generally speaking, police officers can be most helpful to the engineer in the maintenance of signs and markings. They should report promptly all cases where signs are damaged, obliterated or are in need of replacement. However, the engineer should have a planned program for periodical replacement of signs and markings.

Where traffic control devices have been damaged in accidents or for some other reason have been put out of commission, the engineer should co-operate to the fullest extent by repairing the damage as soon as possible. For example, where a control device at an important intersection is damaged, the police should not be expected to provide manual control for an unreasonable length of time. In one case, an electrical storm put traffic signals at several important intersections out of commission. It



was essential that police officers provide manual control until repairs were made. This was done for a period of eight hours. Later it was learned that only a fuse had blown and the repairs could have been made in less than five minutes.

*Speed Zoning*—The erection of speed signs is essential to the practical enforcement of speed regulations. These signs inform the public of the regulations and enable the enforcement officer to present a more substantial case against the violator. In some jurisdictions, maximum and minimum speed rates are established by law. However, in other jurisdictions, power is vested in certain agencies to designate special speed zones or limits. In such instances, enforcement agencies might be consulted as to the practicability of proposed limits. In other words, limits which are not enforceable should not arbitrarily be adopted.

*Highway Improvements*—Where street and highway improvements, such as street widening or repaving are contemplated, the traffic engineer and enforcement officials should be notified or consulted. Usually a particular function is delegated to a particular person. For example, in a street or highway improvement we may have a design engineer, a construction engineer and a contractor, each of whom is only concerned with a specific part in the building of the project and not with the regulation or control of traffic. Inasmuch as this is the responsibility of traffic engineers and enforcement agencies, their approval of the plans should be obtained before the project is started and not after it is completed. Many existing traffic problems could have been prevented if the traffic engineer or enforcement agencies had been consulted beforehand.

*Off-Street Parking Facilities*—Many cities are plagued with the problem of inadequate off-street parking facilities. There have been many solutions proposed, but one thing is certain and that is that the traffic engineer or enforcement officials should be consulted in the proposed design and location of such facilities. They know better than anyone else the congestion and confusion caused by haphazard or improperly designed off-street parking facilities.

*Emergency Regulations*—Where special traffic regulations are adopted to handle large crowds attending sports or other events, they should be amply publicized for the information of the general public. All enforcement officers assigned to such details should be thoroughly familiar with the general overall plan of control.

*Accessibility*—Perhaps the most important suggestion I would like to offer is concerned with the word "accessibility." Administration officials of the three "E's" should be mutually accessible to each other. Often, best results can be obtained by circumvention of tedious procedures and "red tape" which prevents effective action of many organizations. In other words, a personal visit to a particular scene by all interested parties as a group can result in verbal agreement as to a course of action. They can actually go ahead and do the work rather than fill out and file numerous reports which must be cleared through diverse channels and be subjected to unnecessary delays before anything is done.

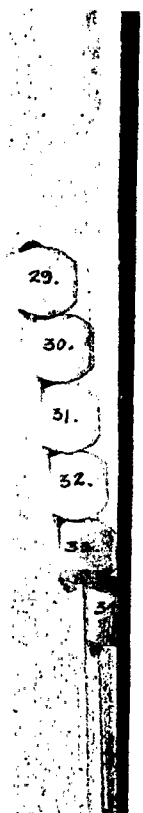
This is not to suggest that routine procedure be ignored, but on certain levels, depending upon the personalities involved, if a friendly spirit of cooperation and determination to get things done exists, much can be accomplished to expedite the realization or fulfillment of the program.

There is much to be gained by the traffic engineer and the educator who will seek information and suggestions from the field experience of enforcement officials. There is no substitute for the advantages of personal contact and the engineer who realizes this can increase the size of his investigative staff by an amount equal to a goodly portion of the traffic officers assigned to the traffic division.

CHAIRMAN DIVINE: Our next speaker, Sergeant Van Blankensteyn, will discuss state and city relationship in enforcement planning.

SERGEANT VAN BLANKENSTEYN: This relationship between state and city planning brought immediately to mind two questions: What is enforcement planning? And when does the state come into it with the city?

Frequently we think of our enforcement planning in a narrow sense, that of a specific project. But in answering the question that came to my mind for the purpose of this discussion, I had to think of it in a broad sense.



I thought of the implications of the driver license administration, the traffic engineering, the enforcement of the traffic laws, the public education and so on down the line.

When we think of a state or city relationship, we think of each of us having a part interest in any one of those different things. And in our planning, consequently, we think, first, of identifying the problem. We must do this before we lay our plans.

Then, in the planning, we think about the objective. The solution constitutes the objective. Then, we go about the collection of facts.

I am going to skip, for the time being, the mechanics of this. That is the point of my talk—the collection of facts and their study, and the arriving at some decision as to the course of action that would be taken in order to arrive at the solution. And last, how will we do it? And with what?

Then, as to this second question of relationship between the city and the state, when does the state come into this picture?

For our purposes I think we can sum up the city-state relationship in two statements.

The state acquires an interest when the effects of the problem extend beyond the corporate limits of the city, township or county. The effects then become something of significance to the welfare of the state as a whole. When the effects of those problems involve responsibility imposed by the provisions of the state statutes, the state enters the picture.

How does the state assist? What does it do?

The state extends various services; gives assistance in some cases. Sometimes it simply supplements, as is the usual case in connection with these traffic problems. The state police or the state highway patrols fill in between the communities to keep people in the habit of doing the things that the authorities in the communities are trying to ingrain in the public driving practices.

How, then, does the state assume this part of working with the community? In some way or another there has to be a leadership. For example, the uniform traffic law enforcement policy in Michigan, the leadership stemmed from the Michigan Association of Chiefs of Police.

It didn't take very much discussion on the part of that group to realize that they had to have the counsel of a lot of people. So, they called on the chiefs of police of all the cities having traffic bureaus and asked them to assign their chiefs to assist in a project to be undertaken by the Safety and Traffic Committee of the Michigan Association of Chiefs of Police. After 18 months of work, they came up with an egg; and it has hatched out into a very satisfactory little enterprise.

The leadership came from that Committee. That leadership has to be something of a catalyzing agent, something that starts reactions and carries on, and keeps them going until an end result is accomplished.

How does this state-city relationship work?

I shall give a brief review here. A problem is recognized; a conference is called. The people are selected who are cognizant of that problem, and who have some responsibility for its solution; and they are brought in to confirm the identification of the problem, if we may put it that way; to estimate the situation; to agree upon a course of action, planning action; and to make their own commitments as to the part each is to play in the collection, exchange and study of that information.

Finally, assuming these discussions take place, and move forward, there will have to come those decisions as to the course of operational action that will be taken to effect the desired solution. Those decisions have to include how the job will be done and what devices will be used.

I touched upon the Michigan uniform traffic law enforcement policy. What the Committee and its advisory group came out with was applicable only to cities. We couldn't tie into it. But we did commit ourselves to the proposition that as we could progress in the development of these principles and methods; we would adopt that uniform traffic law enforcement policy, which includes this particular supplement.

At the IACP Convention last week, our commissioner, Don S. Leonard, was able to say we subscribed to this whole program in principle. The situation will be that some of the cities want the same form that we have now developed for our own use. You know we only changed it a little to take care of lane use. With the rural highways it



isn't a case of being on the wrong side of the street. In Michigan, at least, it is unlawful to be on the extreme left lane of a three-lane highway. Except when turning left, it is unlawful for a car to be on the lefthand side of the center of a four-lane highway. At all other times, you are required to be in the extreme righthand lane, unless you are overtaking or passing, or the traffic volume has become so dense you have to use both lanes. It is rather tricky to incorporate into a few words a statement which will tell what kind of a violation one is committing on one of those highways.

It looks to us as though following the leadership of this Committee we will soon have the same form of ticket, and the end result will be that we will have achieved a complete program in Michigan.

The Operation Safety program is doing much good. It follows the same principle of co-ordination between all departments. Each takes its share in the task and carries that part to a satisfactory conclusion.

In conclusion I want to point out the need for this sort of development. From the official point of view, there is unity in strength.

A chief of police in the State of Michigan who, two years ago, would have wanted to adopt a uniform traffic law enforcement policy as comprehensive as the one that has now been adopted in over 30 cities in the State of Michigan, would probably have been told by his city fathers that he was crazy.

The point probably exists now that any chief of police could do it. Many of them are being asked, "Why haven't you adopted that program? Look at all these other cities—Grand Rapids, Saginaw, Jackson, Battle Creek, Kalamazoo—they have it. Why haven't you got it?"

So now, the chief who wants it simply says, "I want to start this program." Now the people have heard about it around the state and they will want to know, "Well, why haven't you said something about it before?"

What about John Citizen?

From his point of view, it is to his interest to observe the rules of the road in the same manner—the ones that are set forth in the uniform act. But unless there is a uniform presentation of those rules of the road, he hasn't a ghost of a chance of ever knowing how to do that. He may learn a few, but he won't learn them all.

If you have a uniform code, but it is variously interpreted, it will do little good. That is the case as it has been up to now.

I believe that a uniform approach in enforcement in the court handling of violators will do much to bring about the desired objective of maximum safety on our highways.

I have dwelled a little on this uniform traffic law enforcement policy of ours in order to point up the relationships that are involved between state and local governmental units.

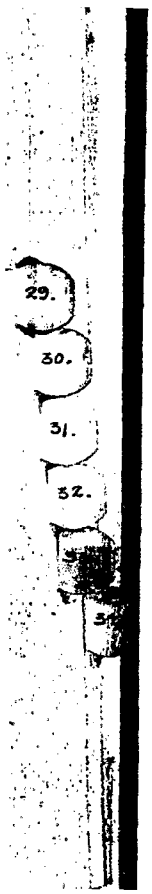
We can capitalize on those relationships but basically we have to identify the responsibility, and each cut his slice appropriately.

*OFFICER JOHN MADL:* (Officer Madl presented a paper prepared by Captain Charles G. O'Regan, Chief of Traffic, Chicago Police Department.)

For the purpose of my discussion I am going to assume that a planned enforcement program has been in force and that all personnel, both traffic and patrol, have been briefed as to time, place and violation of the accident experience and have been assigned accordingly. The question then is how do we evaluate the performance and results of such a program.

The objective of any planned enforcement program is, of course, the reduction of accidents and the production of a smooth traffic flow. It would seem then, that the problem is merely that of comparing the current accident experience periodically against the experience which existed at the time the program was instituted. Actually, it is not as simple as that.

Such a comparison might show an increase or decrease which could be traced to other factors. A reduction might be due in part to a strong educational program which had been conducted simultaneously with the enforcement program; or perhaps some important engineering corrections were made during the period checked. The weather could have been a factor; seasonal accident trends must be considered. The police administrator must remember these and other



factors when he is trying to determine the effectiveness of an enforcement program.

With this in mind the answer to the problem of evaluating the program appears to be a matter of developing and maintaining records which will enable one to keep a close check on the quantity and quality of the enforcement activity of all personnel and to measure the gain or loss in terms of accident reduction.

Before describing record forms which will do this, I think it apropos that we consider some of the problems involved.

Any traffic safety program should be based on the facts obtained through the investigation of accidents. Since our selective assignments and enforcement efforts are based upon predictions made from the study of the accidents of the past, we must remember that results based on anything less than the accepted minimum reporting ratio for cities may not be the best. By this ratio I mean that for every fatal accident, we know there were approximately 40 personal injury accidents and 150 property damage accidents. If we are basing our entire selective enforcement effort and assignments on insufficient data the results may leave much to be desired. It is worthy of mention here that selective assignment is *not* selective enforcement; it is only one phase since it concerns only the time element. We must remember the high accident locations and the violations prevalent there in our selective enforcement program. If we are to measure results accurately, we must consider the authenticity of the predictions; this is dependent upon the adequacy of reporting and the quality of the investigations.

The enforcement activity of traffic personnel is not the only concern of the administrator; the uniform patrol personnel not assigned to traffic must be guided by selective assignment information and enforcement bulletins. Their efforts must be considered in measuring the results of the over-all program.

We must be able to determine both the quality and quantity of all the enforcement effort, as well as any increase or decrease in accident experience. If there is a lack of quantity or quality in the enforcement effort, we must be able to determine why. Do we have a full quota of personnel assigned to patrol and traffic duties, or is there a large percentage unavailable due to sickness, escort duty, office duty or special assignments?

If we have sufficient quantity but not commensurate results in accident reduction, how is the quality with respect to accident cause violations, the time and location of such arrests?

If we have both quantity and quality, do we lack the convictions in court which would give our enforcement efforts the backing needed to be effective?

If we are failing to get such convictions, is it due to poor case preparation, improper evidence, or is there a seeming lack of cooperation on the part of the court or the prosecution?

Are we maintaining an adequate enforcement index? Is it padded with non-hazardous violations?

If the enforcement index is unusually high, is our enforcement effort sufficiently selective or are we making a larger number of arrests than necessary in order to blanket the violators?

Have we reached the point of diminishing returns with respect to our enforcement effort? When we reach that point where an increase in our enforcement fails to continue to decrease the accident experience, we must level off our enforcement activity.

How do our efforts compare with recognized standards such as arrests in at least 50 per cent of the accidents investigated? Did our accident squads investigate 90 per cent of accidents reported?

Are we getting convictions in at least 80 per cent of accident arrest cases?

Are we getting convictions with penalty of at least 90 per cent of all traffic violators prosecuted?

Are our enforcement policies and tolerances clearly defined so as to insure uniform enforcement? This is a must if we are to properly measure results.

All these factors must be considered in evaluating performance and results of any planned enforcement program. The police administrator must have reports which will answer these questions. He must get daily, weekly, monthly, semi-annual and annual reports in highly digested form to enable him to keep abreast of the program and to make such adjustments as appear necessary.



Here are the basic reports which I believe will enable one to determine the effectiveness of a planned enforcement program.

*The Officer's Daily Activity Report*—This report lists such items as traffic activities and non-traffic activities, traffic hours and non-traffic hours. From this report it is possible to determine the number of accidents investigated, accident arrests made, other moving violation arrests, non-moving arrests and special details handled. It indicates the time in hours spent in the various traffic and non-traffic activities, such as time consumed investigating accidents at the scene, follow-up investigations, inquests, court, etc. By totalling the daily activity reports of all personnel by units and districts the police administrator gets a comprehensive picture of how his men are spending their time and what type arrests are being made.

If there are any deficiencies, the time spent on such items as special details, court times, inquests, escorts, etc. may provide the reason.

*Daily Traffic Summary*—This report gives the administrator a picture of the accident situation and also indicates the number of arrests made by the various units for listed hazardous and non-hazardous violations. The report includes information regarding investigations and arrests in accidents, such as the percentage of accidents investigated by the accident investigation unit and by other units, and also the percentage of arrests in the accidents investigated. Comparisons are made in both the accident and enforcement data as to: the past 24 hours; to date this month as against to date this month last year; to date this year as against to date last year; it also lists the percentage changes.

*Personnel Record (Daily)*—This report lists totals of personnel by unit, where assigned today, and off duty today. It apprises the administrator of the number of men on and off duty on any given day and lists reasons for absentees. Here again apparent deficiencies in enforcement effort may be explained. Perhaps there are too many off duty, or too many on office duty, etc.

*District or Precinct Traffic Activity Report (Daily, Monthly, Semi-Annual and Annual)*—This report should list the various hazardous and non-hazardous violations and the total arrests made for each violation. This will enable the administrator to determine how actively the districts or precincts are participating in traffic enforcement.

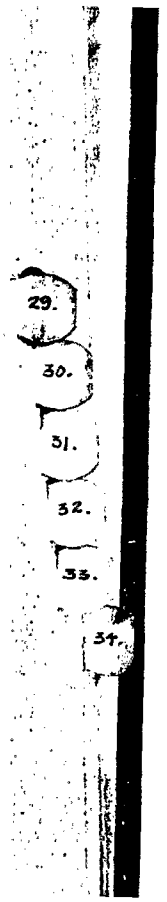
*Traffic Safety Activity Report (Monthly)*—This is a comprehensive summary of accident and enforcement data; it gives the police administrator an over-all picture of the program at a glance. It lists the accident ratio for this month and also this year. It lists the enforcement index this month and this year. It lists the motor vehicle death rate per 10,000 vehicles registered. It gives current accident data as to total accidents, fatal accidents, injury accidents, property damage accidents, persons killed, persons injured and compares the present experience with that of the past.

It lists the total accident investigations made by each unit, the number of arrests made in accident cases and convictions obtained in these arrests. It makes possible the checking of selectivity of the enforcement effort by listing the most frequent hazardous violations with total arrests and per cent of total for each violation; it also lists the number of accidents caused by each violation and the per cent of total for each violation. Thus it is possible to compare the percentage of arrests made for any violation with the percentage of accidents caused by such violation. For example, if 25 per cent of accidents were caused by speed then approximately 25 per cent of the arrests should be for speed.

It lists also a time chart of accident occurrence by hour of day showing the percentage of accidents occurring each hour and the percentage of arrests made each hour. Hence, selectivity as to time can be checked in this manner.

The report lists disposition with penalty and disposition without penalty for each of the hazardous violations previously mentioned. It is therefore possible to compute the enforcement index from this report. If we are failing to get convictions in certain violations, that fact will be apparent.

*Spot Maps*—Maintaining spot maps is an excellent method for measuring selectivity of results. Comparisons can be made and the selectivity of the enforcement effort can be determined almost directly. The arrests spotted on the enforcement map should compare favorably as to time, location and violations indicated on the accident spot map.



*Law Observation Checks*—This is another technique in checking results of an enforcement program. It consists in checking, in civilian dress, law observance at various high-accident areas or streets. By checking speed, red light violations and other indicated high accident cause violations at high accident times, we can determine how effective our enforcement program has been. Have we developed voluntary law observance or do the violations appear immediately after our enforcement is withdrawn? Was the accident reduction due to our efforts or is some other agency causing the reduction? For example if a progressive signal system was set up along a high-accident street and the accident experience dropped as a result, then perhaps further efforts on our part insofar as certain hazardous violations are concerned may bring about an even further reduction.

In closing I want to say that it is imperative that we maintain a close check on the quantity and quality of our enforcement; we must be certain that the quantity is no more than is necessary to control the accident curve. We must strive constantly to improve the quality through better selectivity, and we may thus be enabled to make even further reductions in the quantity necessary to control the accident experience.

The American public will accept restrictions which they feel are fair and impartial. Effective, well-directed, selective enforcement meets these qualifications; it penalizes those who are causing the accidents. For many of the public their contacts with us on the streets and in the traffic court are the only contact they have with their government. To them we are the government. If we are to prolong and foster our democratic way of life, it is important that we be efficient in the administration of our particular phase.

CHAIRMAN DIVINE: Captain J. Paul Shively will tell how to develop official and public support for the planned enforcement program.

CAPTAIN J. PAUL SHIVELY: I think probably the first and most important procedure in the development of public support is to inform the officials and the public of the need for such a program by the use of our record system. This, of course, can be done through several media.

Almost everyone who lives in a city of average size keeps abreast of the news and radio items relative to traffic injuries and fatalities. This is particularly true of parents of small children, who worry considerably about their children getting to and from school. A direct appeal can be made to this group through your local PTA or civic groups.

Fortunately, in Lincoln we don't have to sell the officials on the idea of enforcement. They can usually be guided by the actions of their supporters in the program. They can be made to see the need of it. Daily radio programs on traffic safety, which continually urge the cooperation of motorists and pedestrians alike, of course will do much to gain their support.

Selling traffic safety to the public is much like any advertising program. The plan must be well formulated and must contain many different angles of approach. The truth is today the public must be sold on the idea of saving their own lives.

We used a similar plan in Lincoln a few years ago, and I would like to tell you about it. I think it can be used in larger cities on a multiple scale.

We had 205 deathless traffic days. When this record was finally broken, the reaction was the same as if some celebrity had been killed. The people bemoaned the fact that their record had been broken by a seemingly avoidable accident.

The first step used in this program was the erection of a large billboard on our city ball lot, which depicted to the public just how many days had gone without a traffic fatality. This sign created a lot of public interest in our proposed program.

The next step used was the publicizing of what we called a radio traffic forum, which was broadcast 15 minutes a day and was devoted to analyzing recent injury and fatal accidents, and how they probably could have been avoided. Members of our police department appeared on this program.

This program was carried on for five years in our city and did much to create public interest and to cut the number of our serious traffic accidents.

We continued to accelerate public interest by having our traffic officers wear an arm band, on which was placed the number "300"—nothing more.



This accomplished two things. It created a sense of curiosity in the public; they would ask the officer what was the meaning of the "300." This automatically created an incentive in the officer to find out how many days we had gone without a traffic fatality. We tied the two objectives together.

It is always quite a task to get the older police officers interested in that type of program. With the use of this method, they were as much a part of the program as the head of traffic himself.

The next step to further stimulate interest and support was the use of bumper platters, placed on automobiles, advertising our program—"Help Us Reach 300 Deathless Traffic Days." The number "300" was made as large as possible, so it could be seen for some distance.

There was a problem involved in getting these platters on cars. We finally gained the cooperation of most of the filling stations and they did a grand job in selling this to the public.

Last, but not least, in the program was the use of motion-picture trailers in our motion picture theatres. However, misfortune overcame us, and we had a traffic fatality prior to that time we could use this idea.

Enforcement planning is certainly a good method of reducing traffic accidents, but is of no value without complete support of those participating. I think that any police department in a city of 75,000 or more population should have on its payroll a man or two who is acquainted with the problem and is schooled in public relations work. Many departments lose sight of the fact that it is utterly impossible to expect one man to head up a traffic division and do all the public relations work, too.

In our city, we are fortunate in having a group of ladies and gentlemen, who form what we call a traffic commission. We knew that we couldn't sell the idea of any major change in traffic pattern alone, so we talked the city council and the mayor into appointing *this commission*. They have done a grand job in an advisory capacity to the council. They have also done a good job in selling it to the public.

You need the cooperation of the courts and the courtesy of the officers in the program. If you tie all these things together and keep at it, day by day, it is my opinion that you will receive plenty of support both from the official side and from the public side.

CHAIRMAN DIVINE: I think there are several other points we might examine and take inventory of, to see how we are handling them.

One of those is that there is a definite relationship between departmental organization and effective planned enforcement. How does your police organization measure up?

There is a definite relationship between police training policies and tactics and effective planned enforcement.

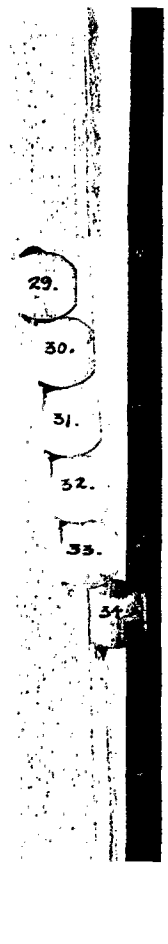
And lastly, how much are you integrating the non-traffic patrol into your planned enforcement program?

Of course, equipment and personnel factors are very important. Your driver records are very important, too.

## Recent Traffic Engineering Progress

By C. W. PRISK
Highway Engineer, Public Roads Administration, Washington, D. C.

Periodic reviews of progress are an essential part of the operation of all big business and street and highway operation is getting to be a pretty big business. According to an estimate made by the American Automobile Association, this year's tourist trade alone will gross approximately six billion dollars. Sixty million tourists traveling in 20 million automobiles are expected to spend an average of $100 apiece during 1948. These rather substantial figures suggest that highway and traffic engineers are not indulging in mere statistical exercise when they inventory their street and highway facilities to see *what they have* and *what they need*. We need to know much



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This program was carried on for five years in our city and did much to create public interest and to cut the number of our serious traffic accidents.

We continued to accelerate public interest by having our traffic officers wear an arm band, on which was placed the number "300"—nothing more.

Almost everyone who lives in a city of average size keeps abreast of the news and radio items relative to traffic injuries and fatalities. This is particularly true of parents of small children, who worry considerably about their children getting to and from school. A direct appeal can be made to this group through your local PTA or civic groups.

Fortunately, in Lincoln we don't have to sell the officials on the idea of enforcement. They can usually be guided by the actions of their supporters in the program. They can be made to see the need of it. Daily radio programs on traffic safety, which continually urge the cooperation of motorists and pedestrians alike, of course will do much [illegible] their support.

[illegible] our democratic way of life, it is important that we be efficient in the administration of our particular phase.

CHAIRMAN DIVINE: Captain J. Paul Shively will tell how to develop official and public support for the planned enforcement program.

CAPTAIN J. PAUL SHIVELY: I think probably the first and most important procedure in the development of public support is to inform the officials and the public of the need for such a program by the use of our record system. This, of course, can be done through several media.



This accomplished two things. It created a sense of curiosity in the public; they would ask the officer what was the meaning of the "300." This automatically created an incentive in the officer to find out how many days we had gone without a traffic fatality. We tied the two objectives together.

It is always quite a task to get the older police officers interested in that type of program. With the use of this method, they were as much a part of the program as the head of traffic himself.

The next step to further stimulate interest and support was the use of bumper platters, placed on automobiles, advertising our program—"Help Us Reach 300 Deathless Traffic Days." The number "300" was made as large as possible, so it could be seen for some distance.

There was a problem involved in getting these platters on cars. We finally gained the cooperation of most of the filling stations and they did a grand job in selling this to the public.

Last, but not least, in the program was the use of motion-picture trailers in our motion picture theatres. However, misfortune overcame us, and we had a traffic fa[illegible] tality prior to that time we could use th[illegible] idea.

Enforcement planning is certainly a [illegible] method of reducing traffic accidents, be[illegible] of no value without complete suppor[illegible] those participating. I think that any p[illegible] department in a city of 75,000 or [illegible] population should have on its payro[illegible] man or two who is acquainted with [illegible] problem and is schooled in public relati[illegible]

work. Many departments lose sight of the fact that it is utterly impossible to expect one man to head up a traffic division and do all the public relations work, too.

In our city, we are fortunate in having a group of ladies and gentlemen, who form what we call a traffic commission. We knew that we couldn't sell the idea of any major change in traffic pattern alone, so we talked the city council and the mayor into appointing this commission. They have done a grand job in an advisory capacity to the council. They have also done a good job in selling it to the public.

You need the cooperation of the courts and the courtesy of the officers in the program. If you tie all these things together and keep at it, day by day, it is my opinion that you will receive plenty of support both from the official side and from the public side.

CHAIRMAN [illegible] ...k there are sever[illegible] ...ne and th[illegible] han[illegible]

## Recent Traffic Eng[illegible]

By C. W. PR[illegible]
Highway Engineer, Public Roads Administr[illegible]

Periodic reviews of progress are an essential part of the operation of all big business and street and highway operation is getting to be a pretty big business. According to an estimate made by the American Automobile Association, this year's tourist trade alone will gross approximately six billion dollars. Sixty million tourists traveling in 20 million automobiles are expected to spend an average of $100 apiece during 1948. These rather substantial figures suggest that highway and traffic engineers are not indulging in mere statistical exercise when they inventory their street and highway facilities to see *what they have* and *what they need*. We need to know much

more than we do about the real value, in terms of traffic service, of existing streets and highways.

A survey of the physical characteristics is of course the starting point in the customary street or highway inventory, but the state or city traffic engineer cannot afford to be satisfied with just a physical description of his roadway plant, no matter how detailed. He must have "use" facts and know how to interpret these as he applies his experience along with known principles of traffic flow and eventually comes up with the answers to some $64 questions like "How many vehicles will that street handle if it is changed to one-way operation?" or, "What will be the effect on the accident record at this intersection if traffic signals are installed?" An inventory on such a basis is exceedingly complex, but it is the foregone responsibility of the traffic engineer to strive continually to refine and complete his knowledge and record of operational facts on facilities under his authority. Only when a reasonable accurate inventory of the traffic limitations of present facilities is obtained can he and his superiors devise accurate plans for future improvement and progress in traffic matters.

During the last year or so, a number of the states have seen fit to examine their street and highway situation at considerable length. Data on *what they have* has been provided largely from the state-wide highway planning surveys, an established cooperative activity of the U. S. Public Roads Administration and the 48 state highway departments. In every case, it has been clear that both *what they have* and *what they need* in the way of modern expressways, rural and urban, and other street and highway transport facilities, have to be evaluated in terms of service to traffic.

The traffic engineer is a great deal closer to this service aspect of the highway than his colleagues, the design and construction engineers. He cannot take much credit or pride in the construction of a pedestrian underpass, for example, no matter how graceful the lines of the structure or how few cracks open up in the concrete, unless the underpass is protecting pedestrians from the hazard, inconvenience and delay otherwise incident to a grade crossing with vehicular traffic. This highway service aspect with which the traffic engineer is concerned is thus seen to be largely a quality factor and like many other quality factors, good and bad traffic engineering cannot always be distinguished by physical count or measurement.

Since 1946 it has been my privilege to have been associated with the engineering phase of the President's Highway Safety Conference. To the extent possible the Conference has sought information on the quality, as well as the quantity of the work being done in traffic engineering. This year's report, entitled "Inventory and Guide for Action," is possibly the most successful one yet from this standpoint. It has as its principal references the National Traffic Safety Contest, the National Pedestrian Protection Contest, and the High School Driver Education Award Program.

More than 600 cities and all 48 states have participated in these competitive efforts for improved traffic safety. With the information from these "contests," some of which I understand are to be known in the future more appropriately as "Inventories," it is possible to do several things. For example, we can now measure the national strength of traffic engineering activities better than ever before. Each city and state can be tested by standards of performance derived from the analysis of traffic engineering activities in many jurisdictions of similar size and character. Also, if we take the Contest or Inventory data from previous years as a base, the amount of progress or failure on any phase of the program becomes quickly evident.

A review of the most recent data on traffic engineering progress shows that orderly advancement is taking place on the accepted functions of traffic engineering—fact collection, traffic planning, traffic design and operational measures. A decade ago, progress was a bit more spectacular, perhaps, but the steady gains of today resulting from the efforts of recognized traffic engineers working in positions of increased responsibility are vastly more effective and substantial.

A majority of the states have now placed the traffic operation and control functions in the highway department. Of the 38 states with regularly established traffic divisions, 34 are in the highway department and 4 are in the motor vehicle, public safety, or similar departments. In 9 of the 10 remaining states, traffic operation and control is a responsibility of the maintenance engineer or a comparable official. Twenty-seven states have established the traffic division with authority comparable to that of other major divisions of the highway department, such as design, construction and maintenance.

It cannot be said that there should be exact uniformity among the states in the matter of organization for traffic engineering, but it is essential that all the functions commonly identified as traffic engineering be vitalized in every state. The centralization of responsibility for traffic operation and control is still in the evolution process in many jurisdictions, but the developments evident in the latest reports give promise of the eventual establishment of a principal division with full responsibility for all traffic operation and control matters in practically all of the state highway departments.

The effective control of highway speeds is one of the more important problems with which state traffic engineering divisions are concerned. In 1947 more than 20,000 man days were devoted to conducting speed studies and preparing appropriate plans for speed control or zoning. This is nearly twice the effort expended in the previous year. Special studies of high-accident locations and the prescription of proper remedies totalled 42,000 man days, a gain of 85 per cent over that reported for 1946. The time spent on checking designs for traffic capacity and safety features amounted to 37,000 man days, also an improvement over the previous year.

One of the most notable gains was in the special studies made for municipalities. The states reported 122,000 man-days in this category, an increase of 55 per cent over the 1946 total. With the spotlight focused so intensely and so deservedly on urban traffic problems, this substantial help from the states, which included nearly 14,000 separate traffic studies in 2,440 cities, is an especially noteworthy factor in any review of traffic engineering progress in the state governments.

Other important state traffic engineering activities where progress has occurred include the channelization of intersections, the construction of sidewalks and other pedestrian aids, and the installation of highway lighting. Much noticeable improvement has been made in the field of traffic control devices as a result of agreement on the new national standards for signs, signals, and markings set forth now in the *Manual on Uniform Traffic Control Devices, 1948 Edition.*

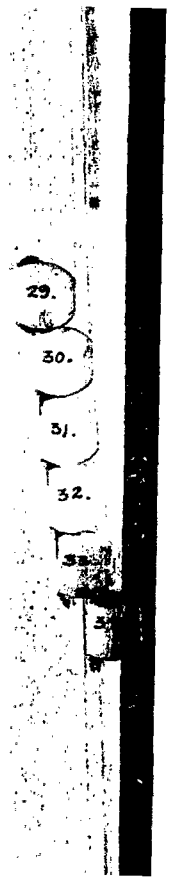
It may interest you to know that the number of new, reconditioned or modernized traffic signs erected by the states in 1947 totaled nearly one million, 30 per cent more than in the previous year. The whole cause of uniformity in traffic control, which is so vital to traffic-handling problems, has been given a tremendous boost by release of the new *Manual on Uniform Traffic Control Devices*, through the Joint Committee representing the American Association of State Highway Officials, the Institute of Traffic Engineers, and the National Conference on Street and Highway Safety. Though the standards set forth in the new *Manual* represent the best available current thought and experience, there is no intent to stifle experimentation and further refinements in traffic control devices. The *Manual* will be a valuable guide to future progress in this direction.

In the city traffic engineering field, it is most encouraging to find that four-fifths of all cities over 200,000 population have now established the traffic engineer as a working part of their municipal government. To a lesser extent the smaller cities have followed suit. More than one-third of reporting cities in the 100,000 to 200,000 population class employ a traffic engineer.

In the smaller cities where there is no traffic engineer a rather interesting trend is developing. Up until the last few years, the police departments have been handling most of the traffic engineering and control functions in many of the smaller cities—presumably because of their close contact with traffic problems through everyday enforcement activities or because of some reluctance or inertia in the city traffic engineering departments or their governing officials. By contrast, the 1947 reports show that only one-third of the cities below 50,000 population now have responsibility for traffic engineering functions located in the police department. The most common arrangement reported is to place the city engineer in charge of traffic engineering.

This shift in emphasis is plain recognition that congestion and accidents can be corrected by the application of engineering





techniques as well as through enforcement measures. Such trends toward specialization in solving the city traffic puzzle are as natural and as necessary as the trend toward greater medical specialization in treating infirmities of the human body. I am confident that true progress in traffic facilitation and safety will closely parallel the extent to which the fundamentals of specialization recommended in the original Action Program of the President's Highway Safety Conference are practiced.

The efforts of city traffic engineering officials are being devoted in increasing amount to studies that are fundamental to sound traffic administration. In many instances they have joined with the state highway departments in the conduct of travel habit and parking studies. These and other similar cooperative activities are an essential prerequisite to designation and design of the urban portions of the new Interstate Highway System, completion of which will bring substantial relief to crowded city streets.

The comprehensive studies of travel habits and parking also provide useful data for determining parking requirements, the feasibility of one-way street plans, the location of interchanges, and the need for special routes. This wealth of information is not produced without considerable effort, however. A large eastern city that has recently completed one of the comprehensive type surveys found that the time required amounted to 800 man days per 100,000 persons in the city. This is added reason for close working cooperation between city and state traffic officials. Well-deserved praise is due those cities and states where their joint action has produced traffic data of value to the entire metropolitan region as well as to the central city area.

Angle parking has held a tight rein on the best efforts of traffic officials for many a year, but 1947 saw the complete or partial elimination of this menace to safe, efficient traffic movement in 188 cities. The improvement was general in cities of all sizes and included at least one-fourth of the cities in each population group up to the 500,000 and over class where only two of the 14 cities of this size indicated that angle parking had been abolished or reduced. Though comparative data for previous years are not available, this 1947 accomplishment is an impressive prelude to the swan song of angle parking in many cities. Angle parking is as out-moded as the horse and wagon that gave it its start. It is an accident-breeder and severely handicaps streets in their primary function of moving traffic.

Still greater attention must be directed toward decreasing the use of the curb as a place to park in central city areas. Complete parking bans are in effect on at least some of the principal business streets in more than two-thirds of all reporting cities over 50,000 population and parking meters are in extensive use in many cities to encourage more turnover and efficiency in the curb space that is available.

A significant fact derived from the 1947 reports is that of the 365 cities with parking meters, only 143 or less than 40 per cent use the revenue produced for traffic betterments. Certainly there could be a marked improvement in parking conditions in nearly all of the 365 cities if the stream of parking meter nickels could be turned toward the financing of desirable off-street parking facilities. There, now, is a good project for some of you city traffic officials to take up with civic groups, merchants, and others who are frequently so anxious to lend a hand in solving traffic problems for you. Recent studies have shown that ordinary curb parking on typical downtown city streets reduces the street capacity by upwards of 40 per cent. This shadow of inefficiency along our city street borders should somehow be relieved.

I read in a Washington paper a while ago of a plan to construct a park-at-your-desk building in that city. The employee will drive up a ramp to his particular office floor, park in a central core of the building, and walk through a vestibule to his desk. This building, said to be the first of its kind in the United States, will accommodate 450 vehicles and construction is to be started in November of this year. It will pay the traffic official who is besieged with parking troubles to take the long look ahead to solutions similar to this since they may eventually offer the greatest feasible amount of relief to his parking congestion.

The myriad activities of traffic engineering considered singly may sometime appear as trifles, but considered in the aggregate, these same activities constitute a powerful force that will often account for the difference between accidents, inconvenience and smiling congestion and relatively safe, easy and free movement of traffic.

Traffic engineering has contributed in outstanding fashion generally to the commendable improvement that has been made in the national traffic accident record of the post-war years. Yet travel is on the increase, and fatalities are still piling up at the rate of more than 30,000 a year, which is far from the irreducible minimum.

The young and fast-growing traffic engineering profession has had many challenges in the twenty-odd years of its life, but few if any have demanded the courage, intelligence and skill needed for successful solution of today's traffic problems. Through individual and collective researches and other fact-finding endeavors, traffic engineers must find the key to improved operation of street and highway facilities, both as we have them and as we should like to have them. The inventories of future years, showing *what we then have* and *what we still need*, will show how squarely this challenge has been met.



## Public Support for Traffic Engineering Programs

By EARL J. REEDER
Director, Department of Traffic and Transportation, Miami, Fla.

Successful traffic administration must be a partnership. The partners are the general public who want to get from one place to another and the official agencies who must provide the facilities and regulate their use to facilitate that travel.

Of course, in a very real sense the one partner is working for the other and it isn't a partnership at all. However, from a practical operating standpoint it must be a partnership in which both parties understand each other and work together.

If in the early days of my engineering training someone had told me that the very best possible plan that may be developed will be of no value unless it is "sold" to the potential user, he would have rendered me a very valuable service. Of course, it seems like an axiom, but over the years I have met many engineers in the traffic field who were experiencing the same difficulty that I have found so menacing in my own experience. They have felt that because a proposed solution of a problem was reached through recognized traffic engineering methods applied by a person with an engineering degree, the public should accept it and not have to be sold on it.

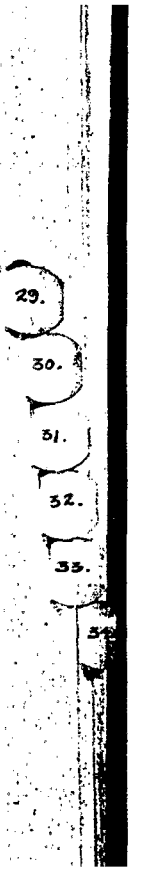
The fact is, however, that if the public does not understand a proposed regulation, control device, or other traffic facility, it may defeat that measure by using it improperly. Or, if the public does not understand how a proposed change in traffic facilities or regulations will help people get where they want to go more easily, opposition can be expected—opposition that will defeat it.

Now, what are some of the major factors in obtaining public support? This could be discussed in many ways. A sales expert could give you some well established principles on salesmanship. A psychologist could tell you how to appeal to persons to get the proper reactions. Both would be correct, undoubtedly, but I want to try to relate what I shall say here more directly to our problems in the traffic engineering profession, than might be done by these men who undoubtedly know a lot more about the basic principles involved than I do. I shall deal with just four major points which I consider to be of vital importance in obtaining public support for traffic engineering programs.

1. *The traffic engineering agency must have a sympathetic attitude toward public views on traffic subjects.*

There is no place in the traffic engineering program for the statement that "We know what is good for you and you will have to accept it," or for other words or even attitudes expressing that same view. Every successful traffic engineering measure must start with a clearly defined recognition of the problem that is facing John Q. Public. Of course, other considerations will have to be brought into the picture, but when that is done it is necessary to show how those considerations relate to the problem as John Q. Public sees it.

The thing that I am urging here is sometimes not easy to do. It becomes especially difficult when, to cite one simple little thing that often happens, the traffic engineering



department is requested to prohibit parking in front of a house that has a driveway and garage, merely to prevent the guests at a neighbor's house from parking there. It is probably a neighborhood squabble in which one neighbor is trying to get even with another one. Such a request certainly tries the patience of the traffic engineer, but he must interpret the department's functions in terms of the public good, what this person would think about it if he saw the department do the same thing for somebody else, and just what it would mean to this person's privileges if his request were granted. In other words, it is not only a matter of recognizing the public's request, but, also, approaching the answer from the public's viewpoint.

Fortunately, the vast majority of improper public attitudes toward proposed traffic engineering measures arise from misunderstandings, or from lack of appreciation of the traffic changes that are taking place, or from a feeling that traffic engineering decisions are made quite arbitrarily and without much consideration for the facts. In such cases an explanation of what the proposal is intended to accomplish, supported by facts that have been gathered concerning the problem and its trends, will usually accomplish the results. Most people are quite susceptible to facts when they are properly presented, but these facts must relate to their views concerning the problem.

2. *Traffic engineering measures that are being applied should be interpreted in terms of definite policies and an overall program.*

When John Q Public says some type of measure applied at the intersection of A and B streets he is apt to wonder why it wasn't placed at the intersections of X and Y streets first. Then he may ask that simple basic question "What do you have to do to get that same thing done at our intersection?" which weighs heavily with the unfortunate that a petition is about to be circulated or some other type of "pressure" is going to be applied if there isn't a quick and satisfactory answer.

Such questions can often be forestalled if the reasons for new measures are given to show why they apply especially to the locations in question. Then, if it is shown that this application was a part of a definite program and that the intersection of X and Y streets will be considered in its proper place in that program, the explanation is generally adequate.

It is difficult for the public to interpret an occasional application here and another one there in terms of a policy and a program unless it is explained. Generally, however, when they know that these are parts of a definite plan and that not all of the rest of the plan can be tackled at one time, they will be satisfied if they know that there is a "formula" for the program that does not contain too many "unknowns."

3. *When two or more persons or interests are involved in a measure that is being considered, they should be dealt with collectively.*

If there are conflicting interests such a procedure will bring them out at once. When these interests are brought together one can get a lot farther with them than when they are approached separately. Where there is conflict, each side is apt to present its own extreme picture individually and put the traffic engineering department in the middle, but it will not go nearly so far in doing this when all the interests are together.

I have had some cases in which requests were made for special traffic or parking regulations, but when I asked for everyone concerned to come together, nothing happened. Of course, nothing happened about the request either, unless we found a valid reason for some type of regulation there. In such a case, we would find no objection to the regulation which we proposed, because everybody concerned had been given a chance.

4. *The traffic engineering department should work through and with representative community organizations in the handling of community problems.*

I can best illustrate what I mean by an example from the City of Miami. In the north end of the city is one of several aggressive outlying business districts, the others being scattered variously about the City. In this business district, called Little River, is an active businessmen's association. About two years ago we made a survey of their parking problem which formerly became extremely complicated during our winter seasons because this business district is traversed by two major thoroughfares, one being the direct route between Miami Beach and Hialeah.



We presented some facts to that association, concerning the parking problem, with some recommendations. For one thing, we urged that they provide some off street parking and get their employees and customers to use it, thus leaving the 192 parking spaces at the curb for more rapid turnover by persons on short missions. They responded quickly with 7 lots for free parking, totaling 700 cars capacity. But that was not all. They insisted that their employees use these lots. They put up placards in their business places urging their customers and clients to use these lots. They requested truckers to use off-street loading facilities in their pickups and deliveries.

The business people of Little River liked the results. They asked for prohibition of left turns at the major intersection. They helped us get a train schedule changed during the winter season to reduce a serious conflict with peak hour vehicular traffic on one of the major thoroughfares. They wrote us letters about improved business.

Whereas, without the cooperation of the Little River Businessmen's Association, these businessmen individually could have resisted these many changes, or grudgingly accepted them, together they accepted them enthusiastically and did a lot toward self enforcement as an aggressive group.

With equal enthusiasm and appreciation I could speak of our department's relations with the Northeast Improvement Association, the Coconut Grove Exchange Club, the Five Points Businessmen's Association, the Edison Center Businessmen's Association, and others, but it happens that we started first with the Little River group because their problems happened to be more acute at the time.

There is an interesting corollary to this story. In the First Points area we asked an unorganized group to get together for consideration of certain traffic control problems. Today there is a businessmen's association as a result.

In this discussion I have not said much about the common media of public information—newspapers, radio, speeches before clubs and organizations, and the like. These are essential allies to a successful traffic engineering program. Without the excellent support of our newspapers and their interesting treatment of feature items, we would have great difficulty in getting our message across to the public. Without the cooperation of the radio through forums, speeches, and attention in their local news casts, we would be seriously handicapped. Without the opportunity to present our message before community organizations, we would not reach the number of people that we can through participation in their programs.

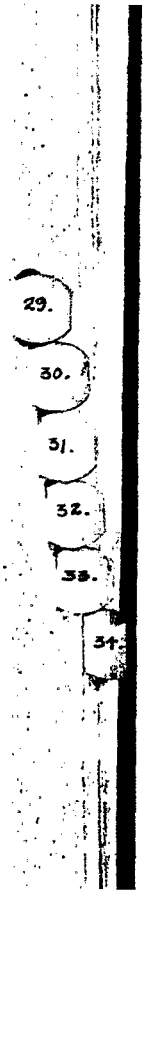
What I have tried to present here is a group of principles for guiding the program that lies back of the good work of these agencies. They are principles which are necessary to make the news that these other agencies can disseminate and to keep that news coming along successively.

Perhaps one of the things that tends to discourage or retard the application of these principles, is the professional fear of compromise with laymen in the field—the fear that it will lower the status of the traffic engineering department and create the impression that people can settle their own traffic problems if they only get together. But, it is a lot better to know what the public thinks the problem is and to either solve that problem or show that it does not exist, than to disregard public opinion and have to undo some things after they are done because the public will not support them.

*In reality*, it is not compromise if the traffic engineer has a program which he can defend. It brings into the technical consideration of a traffic problem those phases which only public attitude and experience can supply. It helps to identify and evaluate the business and personal sides of the problem in a way that the traffic engineer's experience may not prepare him to do alone. With these added concepts he can prepare a more comprehensive and acceptable plan than would otherwise be possible. There is still plenty of opportunity for him to lead in the solution of the problem.

In conclusion I should like to summarize in one sentence what I have presented here as four essentials of public support for traffic engineering programs.

To obtain public support, the traffic engineering department should have a sympathetic attitude toward the public viewpoint; it should interpret things that are done in terms of general policies and program; it should bring together various persons or groups that are interested in a problem, and it should work through and with community organizations.



# What's New in Public Safety Education?

**(Summary of a Session)**

Projects and stunts used in public safety education were presented at a group session. Clinton W. Dreyer, managing director of the Eastbay Chapter, National Safety Council (Oakland, Calif.), presided and Norman Barry, popular announcer for the National Broadcasting Company, Chicago, introduced the various projects.

Jack Soward, public relations director for the San Francisco Chapter, National Safety Council, told about arousing interest through a traffic safety public opinion poll. George Nugent, president of the Kenosha (Wis.) Safety Council, told how traffic safety was given a prominent place in a Centennial Day parade, with an almost-human road hog getting much attention. W. Howard Cox, of the Detroit Traffic Safety Association, presented a sample of a weekly radio broadcast, "It Could Be You."

Four Niles Township High School students from Skokie, Ill., presented an original playlet on traffic Safety written by a former student. Omaha, Neb., and Des Moines, Ia., have a continuing traffic safety competition and activities in the "Hey, Bob" clubs for youngsters. The project was given a lively review by Paul R. (Bob) Stevens, manager of the Omaha Safety Council, and Bob Hassett, city engineer of Des Moines.

Clinton Dreyer described a campaign for safer tires conducted by an association of tire dealers in his area. Sgt. Floyd Hanson, of the Wichita (Kans.) Police Department, showed movies of his city's recent Safety Holiday, a day-long celebration in honor of saving lives. Concluding the program, Paul Platae, executive secretary of the Arizona Accident Prevention Council, presented a dramatic December safety message which was played hourly several days before Christmas last year on individual music reproducers in Phoenix restaurants.

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# What Operation Safety Can Mean to the Local Program

By NED H. DEARBORN
President, National Safety Council, Chicago

The general topic for this session ends on a rising inflection. . . . "When the People Want Traffic Safety . . ." It is a challenge and at the same time suggests an answer that was *not* immediately apparent to many of us in the safety field. When people in this country want something badly enough—they usually get it, whether it's education, a new automobile, or public improvements.

It seems to me Operation Safety already has shown itself to be the kind of practical plan that will help get people to *want* traffic safety—to want it *enough* so that individuals will try to develop safe habits—make it a habit to drive skillfully and with consideration for other drivers and for pedestrians, will make it a habit to behave safely as pedestrians.

What Operation Safety can mean to the local safety program has been shown somewhat in its first year. The program seemed to meet a long-felt need. I believe that is because the plan is simple, logical and practical. It takes into account the people whose interests lead them to take part in promoting traffic safety education. It provides opportunity for broad participation by groups and individuals in the community. Its change of emphasis each month affords variety without losing continuity.

The variety of projects suggested provides flexibility: In the 500 or more communities in which Operation Safety is now being used, there are many different kinds of safety education programs. The police department may have the sole responsibility for traffic safety education—or it may be the local safety council that has taken leadership. Activity under leadership of either the police education unit or the safety council may be quite limited, or it may from the start bring in representatives of official and civic groups so that an active coordinating group includes members representing many of the component parts of the community—city officials, safety groups, civic, professional, and fraternal organizations, women's clubs, the schools, and young people's and children's organizations. Not all of these groups participate in Operation Safety for any one month, but each group contributes to the projects of those months in which the theme is most congenial to its own program.

By bringing into the program the representatives of all types of groups, Operation Safety works in two directions. First, it affords opportunity for maximum participation of individuals, reaches into every home in the community. Second, it enlists the interest and support of the local branches or clubs of national organizations, and develops mutual support from official local agencies whose duties parallel those of state and national official groups.

I have deliberately placed Operation Safety in the community at the start, for safety education must reach the individual—the grass roots level—to be effective. But cooperation on the state and national level *is vital*. The community program gains force from the nation-wide character of Operation Safety. Local groups are encouraged to participate by their national organizations especially those belonging to the National Committee for Traffic Safety. The local units often do a more effective job when interest of the national organization is keen and when traffic safety has been made part of the national program.

Coordination from the state level is highly desirable. State officials can provide statistical information, map state-wide plans, and provide program suggestions keyed to the particular needs of communities within the state—a vital service in the success of any community program. They can also stimulate local participation where leaders are slow in taking responsibility.

Putting traffic safety education on an everyday working basis is somewhat like creating a product for the commercial market. If we were going to make the proverbial "better mousetrap," our product would have to meet certain definite requirements before we could sell it day after day and year after year. It would have to meet a need and fulfill its purpose as well or better than any other available item for the same purpose. It would have to be made available—more readily available than other products offered for a similar purpose. In other words it would have to meet competition and become a habit with the consumer.

What we have to sell is traffic safety. All of us here are convinced of the value and importance of the product.

Operation Safety can be considered the means of merchandising this product. Techniques have been liberally borrowed from the advertising profession, and we can now see for ourselves that they work in selling ideas very much as they work in selling merchandise.

I think you are all familiar with the Operation Safety materials sent out each month. Using a different phase of traffic safety for emphasis, each monthly kit contains a planning guide, filled with program suggestions, projects, publicity ideas—and with it factual background material from which news, radio and other publicity releases are developed. In addition there are poster designs, a leaflet prepared especially for the month's theme, the proof of a newspaper advertisement and other pertinent materials. Whenever there is a related traffic safety campaign being carried on in any month by another organization, this is given due recognition and the suggestion is made that the activities of both be correlated.

It is not the purpose of Operation Safety to overshadow or supplement any activity in the community that also serves to promote traffic safety. Rather, all groups working in the same direction should be brought into the coordinated program—whether it's called Operation Safety or by some other name.

And there, I think, is the kernel of what Operation Safety can mean in any community. It can mean simply putting *into action* every individual and all resources available to "create an atmosphere of safety," as one safety leader called it. Your community safety education program should not become a burden—depending always on the same individuals to do all the work. It is characteristic of most communities that some per-



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sons have more interest, feel more responsible for the welfare of their fellow citizens, and therefore will do more—will more often take part.

However, planned on a different theme each month, Operation Safety seems naturally to draw into action first one group, then another, so that nobody should have to do all the work all the time. To your community this can result in a continuing traffic safety education program. The best way to achieve it is through an active coordinating agency which meets at regular intervals is made up of representatives of your various groups, and works closely with public officials, your newspapers and radio stations. The logical leader or spark plug of such a coordinating agency is your local safety council, since safety is its business. Working closely with the council or other leading groups should be your city officials and especially your police department.

These points have, I think, been emphasized many times but I have a particular reason for laying them before you again. In much of our traffic safety work in the relatively few years we have been concerned with it, many of us have felt like the lone voice crying in the wilderness. On the national level we have been working together. Official agencies have been with us in our concern since the start and many of the member organizations of the National Committee for Traffic Safety are veterans in the fight to reduce the slaughter on our highways. The problem was approached from three angles—enforcement, engineering and education.

I think we all recognize that engineering and enforcement have advanced more rapidly than education has. Our fine express and tributary highways make little of the vast mileage private and commercial motor vehicles cover every day of the year. A thousand-mile auto trip is a commonplace and, while much improvement still is desired and will continue to be demanded in the interest of safety and convenience, still our country's network of highways grows in mileage.

Enforcement, too, has developed new techniques to facilitate traffic flow, control traffic, and prevent accidents, and also to deal with violators of traffic laws.

Of the three E's, education has developed most slowly.

But our overall effort has not been without result. We know that from statistics. In spite of the great increase in vehicle registrations—some 40,000,000 now—and increase in travel, traffic deaths have remained well below the all-time high of 39,900 in 1941. We are bound to look upon this result with some satisfaction, for it reflects much hard work by many agencies—with special credit going to activity growing out of the President's Highway Conference of 1946 and the traffic safety conferences and work done in states since then.

Operation Safety was itself an outgrowth of the President's Conference. And in spite of the fact that many of the organizations represented here had a part in developing Operation Safety—still I expect some of you have had the same sense of discovery about it that I have felt, or perhaps it's a feeling of wonder that Operation Safety was not thought of sooner.

From the welcome it has received in its first year, the program plan and materials obviously filled a need. In providing a practical pattern and authoritative materials, it has suggested even further service for itself. I made the statement some months ago that the same pattern could be used for promoting home safety, farm safety, or safety in any other field where the success of the program depends on reaching the individual.

That, I feel, is what Operation Safety can mean to your community safety program—a practical pattern for developing safe habits in individuals. You have a nation-wide program, supported nationally by official and public support groups, coordinated on the state and local levels, and bringing into action the representatives of every phase of community life. It sounds like an ideal pattern. In many places it still is just something to be hoped for. But there are a few states and communities where it is a reality.

In one city where there were 16 traffic deaths in the first eight months of last year, there were only five in the same months of 1948. In 1948 Operation Safety became a well coordinated program of public safety education in this community. Surely the fatality reduction was more than a coincidence. This community is a rather extreme example of how a safety education program can help hold down fatalities. The record was pretty black; the improvement was spectacular.



In other cities and in states where sound safety education programs have been in existence for years, Operation Safety still found a welcome—and from these cities and states come suggestions which are put into Operation Safety planning guides.

These two extreme examples show how Operation Safety can work for your community. If you lack a continuing safety education program, here is a full scale plan. If you already have a community program for traffic safety, you can augment it with suggestions from Operation Safety and gain from the cumulative effect of nation-wide promotion of the same theme each month.

Already Operation Safety is proving of value in enough communities and states so that it can claim a fair measure of success in its first year. What it *can* mean to a community is being demonstrated. It works. And may its success be catching.

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## The Forgotten City

By PAUL H. BLAISDELL
Executive Director, National Committee for Traffic Safety, Chicago, Ill.

I want to analyze the reasons why any city or group of cities can possibly consider themselves "forgotten" in the traffic safety program. Have we not seen enough evidence here this week that the community holds the key to our problems? Have we not heard it said: "the battle for traffic safety will not be won in national offices, or national organizations or even in state capitals—it will be won on the Main Streets of America"? How many times this week have you heard someone refer to traffic safety with the terms "grass roots?"

Well, there is still a reason for the forgotten city!

The Action Program of the President's Highway Safety Conference, written in 1946, was based on the premise that the traffic safety program written in the national conference would operate primarily at the state level and finally work its way down to the cities, towns and villages. The organizations structure proposed in the Action Program called for statewide official and support groups, and proposed governor's highway safety conferences. Then it "tacked on" a proposal that the same type of structure and a mayor's highway safety conference be activated in the communities.

Although associations of municipal officials were represented in the President's Highway Safety Conference, and although local police officers, school teachers, city traffic engineers and public support leaders helped write the Action Program, the "pitch," if I may call it that, was still directed at the states.

There is a reason underlaying this fact. Local government theoretically looks to the governor as the head of all government in a state, and assumes that if the governor takes the lead, and the state acts, the mayors and city managers will automatically follow.

This is a beautiful theory, but it's a poor example of practical politics. As a matter of cold fact, the approval of a governor is too often a "kiss of death" when a program reaches a city. Haven't we all heard it said in our own city or town, "those smart guys down at the state capitol aren't going to tell us how to run our traffic safety program." I am not presenting a phantom in this assertion; I can see state officials in this room who have told me of the care they must use in the handling of municipal contacts. Let's be sufficiently realistic to appreciate the situation when a governor of one political faith promotes a traffic safety program for the use of a mayor of another political faith.

Our need is for a more direct pipeline from the strategy board of the national plan of action to the firing line in the American city and town. Our need is a planting of the conviction that traffic safety transcends political consideration.

On June 14, 1948, the coordinating committee of the President' Highway Safety Conference acted upon a recommendation of the Committee on Organized Public Sup-

port by agreeing to expand its own membership to include associations of municipal executive officials. This is a first step toward greater municipal harmony in the highway safety program. It is only one step. Our mayors, our city managers must realize that the Action Program, though having a national cover and foreword, has a text which was written by "we, the people" and "we, the local officials," from a background in the hard school of practical experience.

I certainly do not have the answer to all the steps of our pattern for municipalities, but I am encouraged by the realization that something is being done to bridge a very real gap in the whole highway safety structure.

There must be no forgotten city in traffic safety. Without community leadership, both official and public, our efforts here today are unavailing and the national Action Program a document to gather dust on the bookshelf.

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## Two Years of Effort

By DAVID L. LAWRENCE
Mayor, Pittsburgh, Pa.

I wish I could come here and tell you that we in Pittsburgh have found a magic formula for safety—that we have hit upon some new discovery in mass psychology which has eliminated accidents, that has made every driver always law-abiding, that has made every pedestrian always watchful.

But the sad truth is that we have not.

My report today is simply one of hard and unremitting work.

We have accomplished no miracles. We have no boasts and brags. We have simply tried to use all the facilities of a modern society to hold down and to limit one of the menaces of modern society—traffic accidents and deaths.

Pittsburgh, long before my tenure of office as its mayor, was actively seeking to meet its traffic problems.

Almost 25 years ago, in 1925, our city employed the first municipal traffic engineer to be found anywhere in the United States.

We had a long tradition of citizen cooperation in traffic matters. For many years, the mayor has been aided by a Better Traffic Committee, composed of interested citizens whose interest in their city's welfare is keen enough to lead them to advise with their government on traffic matters.

We had well-established programs in traffic safety education, and in traffic planning engineering.

Those programs were effective, but we found a weakness in our structure—a weakness in enforcement.

In a democratic country, law enforcement is as tight and as rigid as the people want it to be. We found that to enforce the traffic laws, we needed public support. We found that we had to make strict obedience to traffic laws popular. We found we had to remove from peoples' minds the idea that it was smart to beat a light, or fix a ticket.

We set out to sell—if you will—the merits of strict traffic law enforcement to the community.

One of our first steps was inspired by President Truman's Highway Safety Conference in the Spring of 1946. Our officials came back from that Conference full of enthusiasm. If it could be done on a national scale, they said, why not for the Pittsburgh district.

Very promptly, we called a Mayor's Highway Safety Conference in Pittsburgh. It was no hit-or-miss affair. Every civic, business, social, labor and fraternal organization in the immediate Pittsburgh district was asked to take formal action in the designation of two delegates. The delegates they nominated were individually invited to attend the conference and participate in its sessions.

The Conference drew 1,500 persons—all of them men and women with the elements of community leadership.

At the conclusions of the sessions, at which Major General Fleming was the principal speaker, the delegates adopted a



platform which included a demand for strict, unbiased traffic law enforcement.

Throughout the next year, the effects of that Conference were felt in traffic interest. Many of the groups represented became traffic-conscious. Their entire membership learned of the program from the Conference delegates. We were given window space, special movies, painted street cars, radio time—all used to stimulate the desire for traffic safety and the law enforcement which produces it.

We did not expect, nor did we experience, an immediate reduction in our traffic deaths and accidents. Habit patterns do not change overnight. However, we did lay the groundwork for public acceptance of traffic law enforcement. We did create and extend citizen interest. To that end, our traffic education program for adults was devoted almost entirely to the enforcement theme. We think we did some pioneering in this field—in poster design and general promotion.

We chose a demonstration area for the exercise of strict enforcement, including the no-stopping rules. It was the heart of our business section, the famous Golden Triangle of Pittsburgh.

Window cards, posters, newspaper publicity, and radio promotion were used to emphasize the idea that illegally parked cars choked traffic movement. Some business interests were unhappy about it. They thought that if we prevented automobiles from stopping before their doors that their business would suffer. For them, we had a slogan: "Good Traffic Flow Makes Business Grow."

We had a parking review committee established out of the ranks of the Better Traffic Committee. It was a group of businessmen set up to hear the complaints of businessmen. We studiously avoided any excuse for anyone to scream about "bureaucrats." The review committee patiently heard out the troubles of those disturbed by the enforcement drive. Its hearings usually brought agreement that the enforcement of existing laws was proper and beneficial to all concerned.

Critics became supporters. Every agency of publicity was used to keep the enforcement problem before the public. And today, I know we have full acceptance of stringent enforcement of our traffic laws.

In November, 1947—last year—we summoned our Second Highway Safety Conference. It was as well attended as the first, and as productive. It was specifically aimed at intensified public support for enforcement.

We have achieved very marked success in cutting down pedestrian fatalities. Since the First Mayor's Highway Safety Conference, the City of Pittsburgh has received a special award from the American Automobile Association for the reduction in pedestrian fatalities. The record to date this year—1948—is even more favorable than that for which we were commended.

Nor have we neglected our program of education in safety.

Through the cooperation of one of the Pittsburgh newspapers, we have inaugurated the Green Pennant idea in our school system. The Green Pennant project, which runs up the pennant over the schools which have a 30-day accident free record, is a definite aid to us.

Last year, we had the lowest child accident fatality record in our modern history. Only seven children were killed on our streets, and six of these were youngsters of pre-school age.

We continue to put our most solid emphasis on enforcement because we know that seven out of every ten accidents are caused by violations of the rules of the road. This enforcement drive has meant some sweeping changes in our police system and in our traffic court administration. We have trained 170 women to act as school crossing guards, relieving many of the policemen who formerly worked such details. Fifty of these released officers have been added to the traffic division, for use in parking and intersection control in the business districts. Six additional officers have been added to police our metered zones. The council has appropriated, on an emergency basis, the funds which are increasing our motorcycle patrol squad by 22 patrolmen and two lieutenants. The new equipment is on order and the men will soon be on the streets.

We are calling a two day session for the entire personnel of the police force. The message of enforcement—the urgency of it, the need for it—will be brought to all the men. It is not a job for the traffic

division alone. It needs the help of every police officer. We are going to follow the sessions with an in-service training program for all police which will emphasize refresher training in traffic problems.

Each police officer is now getting a little message on traffic safety every two weeks—in the one place where he is sure to look—in his pay envelope. The message is directly from the mayor. Each pay period brings a different memorandum on some specific phase of the traffic enforcement program.

Traffic Court has been given additional personnel. It is also being equipped with modern business machines, so that its records will be kept on a punch card system, expediting the work of the court.

During the first eight months of this year, Pittsburgh police have made 19,600 arrests for moving violations. That compares to only 9,500 arrests in the same period last year. I *don't* think the drivers are getting more reckless. I *am* sure the police are getting more vigilant. And I know it all spells safety.

Certainly, any thinking rational person prefers a strict traffic system that saves lives to a loose one which risks lives. That is the premise upon which we are working. We are confident that the people of our city want us to go ahead and make our enforcement tighter. We want to make it stick.

The theme of our next Mayor's Highway Safety Conference is an appeal to the people. We still ask them to "Observe Laws and Conserve Lives." For, beyond all the powers of government, here is a task for the people themselves. No traffic engineer, no expert in safety, no law enforcement officer can hold the wheel for every driver and regulate his pressure on the gas pedal. We can't be at every child's side, nor can we bring clarity of vision and more active reflexes to the aged pedestrian.

This is work for everyone. Safety is indivisible. It doesn't stop between the home and the school. It can't be divided between city and borough, between county and state. It doesn't turn off at the intersection of a state highway and a township road. We must start the message, and reinforce it with vigorous action.

But then the message of safety must penetrate all the way down the line into every person's individual consciousness and into his very subconscious thinking. We must drum it in; we must make safety instinctive; we must make it more than law and more than custom; we must make safety an unbreakable habit.

In these safety conferences, we have many approaches to a single objective. That objective is to save human life. It is man's noblest purpose. I know, that working together, we can score great accomplishments. We in Pittsburgh are trying to do our part.

## Putting Operation Safety to Work in a City

By A. E. AXTELL
City Manager, Kenosha, Wis.

In our city the safety council was an outgrowth of the Kenosha Civic Council, which was organized in 1923 and consisted of representatives from eighteen civic, fraternal, and patriotic organizations. Because many of the subjects discussed at the meetings of the Kenosha Civic Council consisted of matters pertaining to safety, the Kenosha Civic Council organized the local safety council. This safety council existed year after year, talking safety, but with little interest shown during those years, except by members of the safety council. The council was financed partly by the civic council and partly by the city of Kenosha. It was not until the past year that we began to think seriously about safety, and to realize what Operation Safety really means. Today we know that *Operation Safety means a well-planned safety educational program for both the city and the county every month of the entire year.*

So early this year a joint meeting of the city council and the county board was held, at which a representative from the National Safety Council spoke on the national safety program, and inspired by his practical and vital program, we in Kenosha began to make definite plans for an Operation Safety program.

I had been secretary of the local safety council for about ten years, and because of this I was familiar with its limited program. When the safety council came to me about an Operation Safety program in Kenosha, I endorsed it 100 per cent, and assured them of the city's full cooperation.

Realizing it would require considerable funds to finance this work, I personally wrote to most of the patriotic, civic, and fraternal organizations in the city explaining the proposed program and what Operation Safety really is, asking each of them to finance, endorse, and cooperate in the movement by sponsoring at least one month of the proposed safety program. This request met with almost 100 per cent acceptance, and each participating organization was asked to name a safety committee to work with the safety council. All organizations did name a committee, and all committees are taking a most active part in the program.

The success of such a program depends not only upon the three well-known "E's" in safety work—Engineering, Education, and Enforcement—but also an additional "E" for Enlistment; enlistment of the proper persons who really get out and work. This included women's groups, Parent-Teacher Associations, etc. In speaking of the fourth "E" mentioned above, it is absolutely necessary to have one key person who believes whole-heartedly in Operation Safety, and who constantly thinks and talks Operation Safety. In our city we were fortunate to have such a man, and he is contributing in a very great measure to the success of the entire program.

Our next move was to get the full cooperation of all officials of the city and county, as well as any state officials who might have anything to do with state highways entering the city.

We then appointed a coordinating committee, composed of the chief of police, the sheriff, the captain of the fire department, an insurance man, and a safety engineer of one of our industrial plants. This committee in conjunction with the National Safety Council, from which we received all of our posters and planning guides, worked with and advised the committee selected by the different organizations regarding the program of the particular month they sponsored.

We also secured the splendid cooperation of both the local newspapers and the local radio station, which gave story after story, and as much time on the air as we requested. Movie trailers were purchased by one of the organizations sponsoring a month's program, and through the cooperation of all local theater managers, movie trailers from the National Safety Council were shown. These trailers, by the way, remain the property of the Kenosha Policeman's Protective Association, which was one of the organizations sponsoring a month's program.

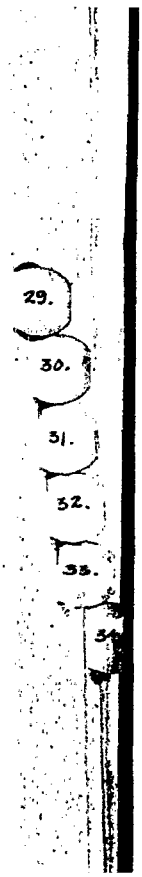
In conjunction with our Operation Safety program, both the public and the parochial schools increased the number of junior school patrols, and they were placed under the supervision and direction of our sergeant of police in charge of traffic.

Whereas in former years these students were merely appointed by the school officials, this year all members of the patrol were brought to the municipal court room where members of the safety council, the chief of police and the city manager gave them short talks, encouraging them in their work. They were then officially sworn in by the municipal judge. We believe this impressed these junior patrols to a point where they will better carry out their work and responsibilities.

The commitee also arranged for announcements to be made at all public gatherings, ball games, band concerts, bike races, etc., calling their attention to the program, the slogan for the month, and the organization sponsoring that particular month. Lumber companies donated poster boards for the 25x38 traffic posters. These were placed in strategic positions by the city workers, and the posters on them will be changed from time to time.

The Centennial parade, which was viewed by over 45,000 people, was led by a safety trailer truck with appropriate posters, and a public announcement system sounding the slogan for that particular month. Posters were placed on all police and sheriff squad





cars, as well as the city and the county motor vehicles.

In starting the Operation Safety program in Kenosha the city purchased the green cross flag, which was raised at a formal ceremony. The press was present to take pictures, as was the radio station in getting a wire recording of the entire ceremony.

We feel that the committee, which was selected very carefully, has done a good job in selling the people of Kenosha the fact that the Operation Safety program as outlined above is a very necessary and worthwhile program, and should be continued.

The records show that the traffic accident rate in Kenosha has been considerably reduced this year during the first nine months of 1948 compared with the same period in 1947. I am sure that by the end of the year a definite reduction in accidents will have been effected, and that there will be an increasing reduction year by year as this idea of Operation Safety becomes implanted in the minds of our citizens.

In the field of industrial safety, our local manufacturing concerns, working through the Kenosha Manufacturers Association, are doing an outstanding job within their organizations. They are also cooperating with community safety work as it involves industry and the welfare of the community. Our manufacturers were keenly aware of the general upward trend in industrial accident rates over those of pre-war period. Facing this problem squarely, the Kenosha Manufacturers Association formed an Industrial Safety Council to coordinate the safety systems in individual plants and to sponsor an all-out campaign for the greater protection of employees on the job.

The Council, which is a division of the Kenosha Manufacturers Association, was set up by the Association's Safety Committee with the following threefold purpose:

1. To provide contact with safety engineers and directors for conference discussions on accident prevention problems and the administration of an educational program of benefit to the employees of local industry.

2. To cooperate with local, regional and national safety organizations and other agencies interested in the promotion of accident prevention.

3. To cooperate with the National Safety Council, Wisconsin Safety Council, Wisconsin Industrial Commission, Motor Vehicle Department, Wisconsin Highway Department, and the Wisconsin State Board of Health in their accident prevention and health activities.

The Council operates under the direction of an executive committee which meets twice a year. The membership of the Council is composed of the safety director; the individual who is responsible for, and in charge of, safety for each manufacturing plant in the Association. Meetings are held monthly. Activities include the development and promotion of safety programs and safety training in industry, the sponsoring of city-wide industrial and safety health programs in cooperation with the city administration, representation of industry in all community safety programs, and the maintenance of statistics, research, educational and training programs for safety engineers, industrial workers and employees.

Round table discussions are held, reports are given and information exchanged pertaining to industrial accidents and methods of prevention. On special occasions, nurses, foremen, office assistants, doctors, and city and state government officials are invited to attend meetings as guests and to hear speakers on subjects pertaining to industrial and community safety.

The Industrial Safety Council executive committee meets periodically and sets policies for the operation of the Council. The Statistical Committee compiles safety statistics monthly, along with plant safety records for the preceding period of a year and a half in order that up-to-date comparative figures may be available for the use of this group. The program committee plans for the coming meetings, securing speakers who are authorities in their respective fields. This committee maintains close contact with the membership in order to determine their preference and requirements with respect to topics of discussion.

Accident frequency and severity rates are reported by all council members monthly. Monthly results are compiled and entered on a five-year master chart for review and study at each meeting.



After carefully studying the industrial accident situation the Council decided that one of the most important phases of the problem was the human element, inasmuch as an investigation of a representative number of accidents indicated that in 98 per cent of these cases the mishap was due to the failure of the worker to use protective devices or safe working methods.

Accordingly, new programs of job safety training were promoted throughout the membership of the Association. Special attention was given to the matter of letting employes know that top management was keenly interested in the programs. In this respect our industrial management has long been aware of the fact that safety is good industrial and public relations, because it is a human and economic need, because it is beneficial to all, and because safety means good citizenship, good industrial management, cooperation between employer and employee, and finally constructive, cooperative thinking and living.

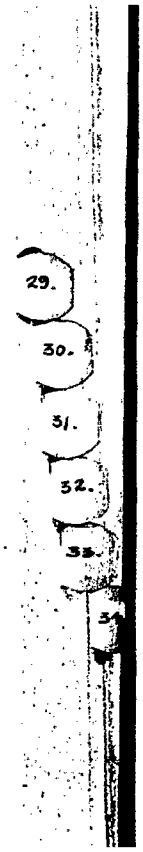
Special attention was given to making foremen and supervisors increasingly safety minded. The keynote thought of the program for these groups pointed out that a good departmental safety record indicates that the foreman is interested in the welfare of his men; has his men well trained; keeps his department in good order; and his mechanical equipment in safe operating condition.

All plant safety programs were reviewed to be sure that the proper attention was being given to the training of new employees in the safe way to perform their work, as it is believed that the importance of the safety education of the new worker cannot be over-emphasized.

These are but highlights of the activities of the Industrial Safety Council. The overall program covers all phases of good safety practice, and one of the Council's main objectives is to sell the idea that safety is a continuous job that can only be accomplished by making safe thinking and safe acting a habit of all employees and supervision.

The results of this program may be judged by the fact that Kenosha, with an industrial payroll of 16,500 employees, which includes 33 heavy metal working plants, had an accident frequency rate of 20.7 for 1946—15.3 for 1947—and 13.5 for the month of September, 1948. Kenosha rates are the lowest in the State of Wisconsin, and are also under the national record.

I think it can be safely stated that the effect of the educational campaign is such that the great majority of Kenosha industrial people—from company presidents to janitors and watchmen—are constantly striving to maintain and improve the safety record.



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# TRANSIT INDUSTRY

**As presented in the Transit Sessions of the 1948 National Safety Congress**


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**Volume 29**
**Transactions**
**1948 National Safety Congress**

GREEN CROSS FOR SAFETY

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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?".

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

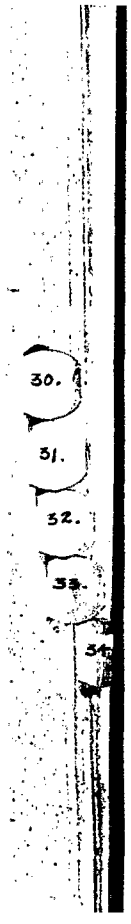
Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE TRANSIT SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Transit Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Transit Section carries on in behalf of its members, and for the benefit of accident prevention work in the transit industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in day-to-day transit safety programs. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on page 43 of this volume.



# The Use of Tests in the Transit Industry

By GLEN U. CLEETON

Director, Division of Humanistic and Social Studies, Carnegie Institute of Technology; Consultant on Employment and Training, American Transit Association

Interest in the use of tests in employee selection has increased tremendously in recent years. Available evidence indicates that at least one hundred transit companies are using tests in one form or another, and probably an equal number of companies could be added to the number indicated if full information could be obtained. This growing interest in tests demonstrates a desire to place employment and upgrading of employees on a sound basis. However, unless tests are chosen and used with understanding, and unless the information made available through their use is applied with common sense, experience with tests is likely to be disappointing.

Probably no employment device is more thoroughly overemphasized by professional enthusiasts, nor more completely misunderstood by the average employer, than tests. Strangely enough, both of these groups err in the same direction. The professional enthusiast *claims too much for tests*, and the average employer expects too much.

Test scores do not provide a *substitute* for other information normally used in employment; however, they do provide a *supplement* to other information. Used as a substitute for other employment information, test scores are likely to be wholly *inadequate as a basis for forming judgments* about the suitability of prospective employees. This is true because tests reveal information on one or more special capacities and personal characteristics which the new employee is expected to bring to the job. Thus, if test scores alone are used, important qualities or limitations of the candidate are likely to be overlooked. Hiring by tests alone is equivalent to hiring only that part of the candidate revealed by the tests; whereas, the candidate brings a whole personality to the job.

Satisfaction from the use of tests in selection requires that the tests used be chosen with adequate understanding of the major requirements of the job and equally competent understanding of the sampling qualities of the tests. With this principle in mind the American Transit Association, through its Committee on Selection and Training of the Operation of Service Division, made an analysis of the fundamental characteristics of the job of street car operators and of the job of bus drivers. On the basis of this information, duties and responsibilities were determined and job *specifications* were prepared. The fundamental requirements of the job were then translated into the personal qualities necessary for the proper discharge of duties and *responsibilities*.

By grouping related traits, nine essential qualities emerged as follows:

| *Quality* | *Favorable* | *Unfavorable* |
|---|---|---|
| 1. Moral Character | Honest, trustworthy, sexually well-behaved. | Dishonest, deceitful, sexually promiscuous. |
| 2. Mental Ability | (To test specification levels) | |
| 3. Motor Ability | (To test specification levels) | |
| 4. Health | (To specified physical standards) | |
| 5. Motivation | Careful, heedful, curious, interested, industrious, painstaking, diligent, prompt, active, earnest, desires financial stability. | Lazy, overambitious, indolent, oversealous, idle, dull, dilatory, financially unstable. |
| 6. Stability | Calm, unruffled, cool, steady, practical, stoical, level-headed, composed, even-tempered, serene, sober. | Nervous, irritable, impetuous, vehement, intolerant, agitated, fidgety, restless, changeable, inconstant, unsettled, fitful, unhappy, worried, intemperate, easily disturbed. |



| *Quality* | *Favorable* | *Unfavorable* |
|---|---|---|
| 7. Maturity | Responsible, rational, adult, answerable, realistic, restrained, disciplined, fair, fully-developed. | Irrational, childish, gullible, superstitious, infatuated, overconfident, nonsensical, foolish, extravagant, irresponsible, undisciplined. |
| 8. Sociability | Congenial, friendly, agreeable, fraternal, kindly, amiable, cordial, good-humored, good-natured, sympathetic. | Antagonistic, unfriendly, quarrelsome, controversial, unkind, spiteful, bitter, malicious, ill-natured, ungracious, conceited. |
| 9. Manner-Appearance | Neat, wellgroomed, soft-spoken, polite, quiet. | Slovenly, unshaven, loud-mouthed, impolite, boorish, ill-mannered. |

The matching of selection techniques with qualities requires a careful study of procedures and the development of a step by step plan of selection. Such a plan has been developed by the ATA Committee on Selection and Training and is reported in a manual entitled *Selection and Employment of Transit Operating Personnel*.

Administering tests is part of the recommended technique for selection. However, as already noted, tests alone will not provide a complete measure of an applicant. Information obtained through tests must be supplemented by information obtained through personal history, references, confidential investigations, physical examinations, and evaluative interviews.

To present in detail the procedure recommended in the manual would require more time than we have at our disposal. Therefore, sheets have been prepared which show an application of the procedure in a particular company.

**Application of the American Transit Association Selection Procedure for Transit Operators**

| *Operator Qualifications* | *Sources of Information* |
|---|---|
| 1. Is the applicant old enough to be stable and responsible, yet young enough to be trainable and to have prospects of a long career with the company? | 1. Application<br>Credit Bureau Report<br>Birth Certificate |
| 2. Is he honest, reliable, of good reputation and moral character? | 2. Credit Bureau Report<br>References<br>Personal Investigation<br>Police Report |
| 3. Is he physically sound and in good health? Does he meet standards on vision and hearing? | 3. Medical Examination<br>Visual Skills Tests |
| 4. Has he a strong desire to do this type of work? Is he likely to continue to be satisfied in this job? In other words, is he properly motivated? | 4. Application<br>Interview<br>References |
| 5. Is he likely to be an industrious, steady worker who can be depended upon to do his job day by day in an efficient and attentive manner? | 5. Application<br>References<br>Interview |
| 6. Is he clean-cut, neat, well-mannered, and of good appearance? Will he make a good impression on passengers? | 6. Interview<br>References |
| 7. Is he affable, friendly, and congenial? Is he likely to get along with fellow workers, supervisors, and passengers? | 7. Interview<br>References |

| *Operator Qualifications* | *Sources of Information* |
|---|---|
| 8. Is he mature, stable, realistic, and emotionally well-balanced? Will he remain calm, composed, level-headed, and even-tempered in the face of emergencies or annoying situations? | 8. References<br>Interview<br>Personal Reaction Test |
| 9. Is he teachable? Can he grasp instructions quickly? Can he learn to do, with speed, skill, and self-control, the movements required in operating a commercial passenger vehicle? | 9. Application<br>Interview<br>Standard Examination<br>Motor Ability Test |
| 10. Is he likely to be a careful and safe operator after he has learned the job? | 10. References<br>Police Report<br>Application<br>Personal Reaction Test<br>Motor Ability Test |

Since time does not permit detailed discussion of all of the steps involved in an evaluative selection procedure, three tests developed by the American Transit Association for use in transit operator selection will be considered briefly. These tests, which are widely used in the transit industry, are:

1. The ATA *Standard Examination for Transit Employees.*
2. The ATA *Personal Reaction Test.*
3. The ATA *Motor Ability Test.*

In developing tests for operating personnel, experimental studies have been made with reference to three important management problems, namely: training, accident control, and public relations. A pencil and paper test of mental ability known as the ATA *Standard Examination for Transit Employees* has been compiled which measures the general learning capacity of the individual.

By applying results of the *Standard Examination*, it has been found possible to select candidates for operating jobs who can benefit from training by mastering instructions at the required level of difficulty and at an appropriate rate of speed. Conversely, it has been found possible by means of the test to eliminate those persons who obviously cannot satisfactorily complete training and those likely to become dissatisfied with the job after a trial period. Thus, through application of the test, candidates likely to make suitably qualified operators in an optimum training period can be obtained.

The number of separations through failure to complete training has been reduced and the number of voluntary separations resulting from loss of interest in the job has likewise been reduced by hiring within specified test score areas. Furthermore, through selection of candidates by means of this test, many companies have found it possible to organize their training programs more effectively and to conduct training on a higher plane than is possible with a less carefully selected group of trainees.

Another critical factor in the operation of transit vehicles is public relations. Here the element of the operator's personality becomes important. Stability, maturity, and sociability are generally recognized as traits significantly related to an operator's ability to deal satisfactorily with passengers and other persons with whom he comes in contact in performing his duties. In general, these qualities are related to emotional balance.

While no wholly suitable test for measuring emotional balance has been devised, the ATA *Personal Reaction Test* has provided promising results. The qualities which this test tends to reveal are those of stability and maturity, particularly in reference to public relations and street traffic situations. Recent checks of experimental results obtained through use of the test against clinical diagnoses by professional psychologists indicate that scores on the test are significant. Experimental use of the test indicate that the characteristics measured have a bearing on both susceptibility to accidents and successful public relations.

Generalized learning ability and emotional qualities as measured by tests are not sufficient evidence that a candidate will be able to master the intricacies of the job of operating a street car or bus. Operators



on such jobs must learn to do certain things which involve precise sensori-motor coordinations, control and direction of attention, and the ability to make quick discriminate choices in response to changing environmental conditions.

To measure these qualities, a highly complex mechanical device, the *American Transit Motor Ability Test*, has been developed. This device was specifically designed to determine whether an applicant has the sensitive, discriminatory, and motor coordination capacities necessary to learn to perform the duties required of a successful transit operator.

The test measures capacity to acquire skills related to potential ability, but in no sense does it measure existing acquired skills, such as ability to drive. The test goes far beyond simple reaction tests and simple coordination tests in its measurement. By means of intricate timing and recording mechanism, it reveals an applicant's ability to understand and respond to instruction, his ability to coordinate ideas and actions, his ability to concentrate attention and to resist distraction, his speed of discriminative response, and certain physical and temperamental qualities related to proper job performance. As proof of its validity, one company found that it could reduce training mortality by 90 per cent through the use of this test.

Crucial to a transit operator's success is his ability to avoid accidents. For the purpose of selection with reference to accident liability, many tests, particularly of the simple response type, have been tried and found to be almost wholly lacking in validity. However, the *American Transit Motor Ability Test* does provide a measure for predicting accident susceptibility within acceptable limits. One company found that twice as many men with high scores on the *Motor Ability Test* were among the most favorable accident record group as compared with the men with low test scores. By taking only those applicants with satisfactory *Motor Ability Test* scores, another company found that the probability of selecting men whose accident records were better than average was increased to 4.5 to 1.

It is evident that this test measures qualities related to the learning of street car and bus operation and to probable accident-free performance more satisfactorily than any other device now available.

## The Use of Tests in the Motor Transportation Industry

By PROFESSOR AMOS E. NEYHART
*Administrative Head, Institute of Public Safety, The Pennsylvania State College; Consultant on Road Tracing, American Automobile Association*

It is my firm opinion that unless we effect a reduction in accidents on the streets and highways through voluntary measures, the chances are very strong that every truck, bus and taxicab operator will be seriously penalized by restrictive legislation on the part of the federal government.

Certainly you will agree with me that it is far better that we find sound solutions for this business of unnecessary accidents ourselves, and not make it necessary for the government to take drastic action.

One of the basic factors governing the efficient use of automotive equipment and certainly one of the approaches to the solution of this accident problem is: better selection and training of drivers to bring about safer driving and better handling of equipment.

### Which Driver For the Job?

Proper selection of drivers is one of the most vital of all the factors that contribute to real operating efficiency. It is undoubtedly the most difficult because of the fact that it deals with human behavior. Operators everywhere are up against this serious problem and are looking for help.

The tendency in the past has been to confine the selecting program simply to hiring drivers who could point to their long experience as evidence of being highly skilled. Management apparently believed that, with such men, training would be unnecessary or reduced merely to company policies. Aiming to secure only seasoned men and letting "the other fellow" do the training contributed to the scarcity of good drivers.

In other industrial fields, selecting and training of men for production jobs is generally accepted as essential to filling the job satisfactorily. When it comes to driving, however, it is so easy to stumble into that old pitfall of assuming that the driver with ten years of driving experience must be well qualified.

The fleet owner's hidden investment in drivers is one of the vital items influencing costs. No owner's ledger sheet reveals the total cost here. Some operators guess that the cost of hiring a driver and putting him to work is less than ten dollars; others who actually tried to analyze the cost find that it often runs over a thousand dollars per man. The time in hiring a driver and putting him to work is just a fraction of the sum total. The hidden cost of improperly selected and improperly trained drivers causes excessive losses. This lack of scientific selection and training leads to abnormal turnover of personnel. The expense of driver turnover involves many factors, one being the cost of accidents at the hands of drivers who do not make good on the job and eventually leave the company—men who were not properly selected originally or who were not properly trained after going to work.

Another big factor is the cost of the time that vehicles are out of service for mechanical failures that could have been avoided, preventable repairs or when vehicles are off the road because of other incorrect handling by drivers.

One intangible cost factor is the loss of company goodwill through the absence of courtesy and the lack of desirable attitudes of drivers who do not make good and who, therefore, have no interest in the company and do not stay long. Customer relations, accidents, equipment off the road, supervision, training, length of life of trucks, and other factors—all are involved in the high cost of driver turnover.

In the interest of developing better driving, greater safety, and expert care of motor trucks; in the interest of cutting the high cost of driver turnover; the following "Tests for Use When Selecting Drivers" are suggested to help the operator improve his 'batting average' in selecting drivers who will make good on the job, have a minimum of accidents, and remain on the job a reasonable length of time. No operator is expected to use all of the tests but to select a few that are appropriate for his particular business. These tests can be used by the owner of less than five vehicles, or by a fleet owner of thousands of vehicles.

There are certain aspects of a prospective employee's performance on the job that can't be obtained through the interview, application blank, references or accident record. To rely alone on observing the performance on the type of work for which an individual is being employed, is too time consuming and *too costly*. There is, therefore, a need of having a short-cut method of learning about a person's future performance on the job. Tests may be considered a short-cut method of getting *such information*.

Since my talk is to deal with "The Use of Tests in the Motor Transportation Industry", I'll delete such important tools of selection as job analysis and specification, interview, application blank, references, state driver's license bureau record, city police or traffic bureau record and fingerprinting record.

### What Are Some of the Tests That Are Being Used?

The following tests aid in finding the right man for the driving job. While the small operator cannot, obviously, take the time to utilize all of them, there are certain items he should consider fundamental, adding to his selecting procedure other items he is able.

1. *Physical Examination.* To check physical condition as required by ICC Motor Carrier Regulations for bus and truck operators coming under its jurisdiction and for all new drivers. (This step makes certain, in advance of hiring, that the applicant is physically able to make good on the job.)

2. *General Intelligence Test.* To check mental characteristics. This helps management to obtain an indication of the type and level of work the applicant eventually will be able to handle—whether he is too smart, or not smart enough; too fast, or not fast enough, for a particular job. Such traits as excitability, alertness, worriedness, abnormal characteristics, self-confidence and resistance to distraction should be checked.

3. *Visual Speed and Accuracy Test.* To serve as a measure of the applicant's speed and accuracy in perception. (Since 95 per cent of the cues in traffic come through the eyes, it is very important that the driver gets a clear picture in order to make intelligent decisions).



4. *The Personality Inventory.* To check personality traits. For fleet operation, enforcement work, or other positions where the employee contacts the public and the customer, management must have a vital interest in his personality. Tests which show up belligerent and morose personalities are very useful to the company which values its public relations position.

5. *Vocational Interest Blank.* To check basic work and hobby interests. (Successful people in any certain occupation have as high as 75 per cent *interests in* common. Should any applicant show 75 per cent interests in common with successful drivers, he should prove to be a good driver also).

6. *Attitude Test.* To determine attitude of applicant toward traffic laws, other drivers, pedestrians, and reckless driving.

7. *Traffic and Driving Knowledge Test.* To check on knowledge of sound driving practices, signals and sign markings; local, state, and federal operation rules.

8. *Driving Skill Tests.* To determine an applicant's ability to handle a vehicle in *close* quarters. (A series of carefully developed driving skill tests have been devised. They are being used more and more in driver selection and training programs. Such tests generally are given on company property in a well-marked "testing area" or a little-used city street. Tests include smooth starting, shifting gears and stopping; driving forward and backward on a straight line; gauging space when steering in close limits; stopping smoothly at 20 m.p.h.; gauging limits of front and back of vehicle; parallel parking; a brake reaction detector test to get a measure of reaction-time distance and braking distance at different speeds; other tests to reveal driving skill. Detailed information on tests, with rating scales, is available from the Institute of Public Safety, The Pennsylvania State College, State College, Penna.).

9. *Road Tests in Traffic.* To get a true measure of an applicant's ability to handle a vehicle in traffic. (Many employment managers believe that the only way is to have him prove it in traffic. A road test is highly desirable if given properly and *planned beforehand* so as to develop accurate information about the applicant. A trained observer, using a printed, carefully developed check list, rides with the applicant. The route is known to the observer in advance, and includes right and left turns, stop signs, traffic lights, upgrade, curves, railroad crossings, and other maneuvers pertinent to the job. Since all applicants are tested over the same road course, comparative records of ability can be developed.)

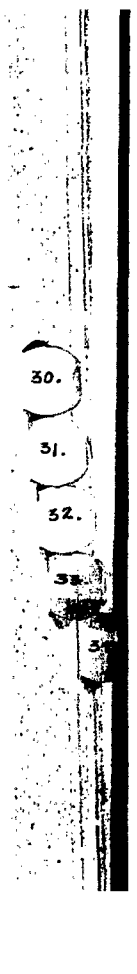
10. *Psychophysical Tests for Driver Limitations.* To help the fleet supervisor discover physical or sensory limitations of a new applicant for a driving job. (A good driver testing program includes checks on the following important characteristics: acuity of vision, color vision, depth perception, field of vision, night vision, reaction time, stereoscopic eye tests and hearing. A number of practical special devices have been developed for these activities. If the limitations are minor or correctible, the applicant may be sent to a doctor, or suggestions may be made as to methods of compensating for the deficiencies or limitations. However, if *the doctor considers them too severe, it is* recommended that the applicant not be employed as a driver.)

#### Limitations of Tests

1. A test will do only what it is constructed to do.
2. Needed testing areas must be properly identified before selecting the tests to be used.
3. The tests used must be valid and reliable measures of the areas identified.
4. The test standards employed must be checked with the demands within the particular organization.
5. Professional assistance is necessary in developing the testing program.
6. *Test results never stand alone.*

Tests are tools for obtaining certain specific information which must be evaluated along with the information obtained from the interview, the application blank, references, etc.

Through the use of a testing program, the motor vehicle fleet operator today has a way of improving operation, cutting costs, and making his vehicle a better public relations asset on the highway by more careful selection of the representative to whom he entrusts an expensive vehicle, a valuable cargo, and his reputation.



# Organizing for Transit Employee Safety

By H. T. DORNAN
Safety Director, Bluebird Coach Lines, Inc., Lyons, Ill.

The title "Organizing for Transit Employee Safety" covers a great deal of territory. The amount of energy, time and dollars put into this activity will depend largely upon the size of the organization and the past experience of the company. A large organization with many injuries would, of course, have a much more elaborate safety program than a large organization with few injuries. Also a small organization with a bad experience will put more time and effort into a safety program than a similar small organization with a very good experience.

Since our organization is relatively small and has a minimum of personal injuries, I am not going to give you our program but am going to give you those elements of a complete program which could be used in a larger organization.

Too many fleet organizations overlook the employee safety problem. Fleet engineers who have had training only in fleet problems are more or less responsible for this attitude on the part of the management. This branch of safety dealing with injuries to employees and commonly referred to as industrial safety should get the attention of every fleet man who intends to do a thorough safety job within his organization.

In some states it is possible to vary the compensation insurance rate as much as 500 per cent or more. That means, that your insurance rate could vary between $2,000 per year and $10,000 per year in a small organization or from $20,000 to $100,000 in a larger one. I think you will agree that in either case compensation safety should not be overlooked.

Many states now use the experience rating plan whereby you can get a debit or credit rating on manual rates, depending upon your experience in past years.

*Realizing that here is a field in which you* can make some progress and save some money for the company is important. As proof that industrial type accidents can be reduced, let me point out that there are many times as many industrial safety engineers as there are fleet engineers. Industrial safety engineering has been in existence many years as industrial management in the more hazardous industries realized long ago that injuries to employees was one problem they had to lick or go out of business. Fleet engineering is fairly recent. It had just begun to develop in the 1930's. Most federal, state and city laws dealing with commercial vehicle operation were just promulgated in the middle or late 1930's.

I will give you some of those elements which can go into an industrial safety program with a brief discussion of each. This is by no means a complete list but if you use ⅔ of those elements mentioned, then I am sure you will show improvement. Briefly these elements are as follows:

1. An analysis of accidents.
2. An industrial safety committee.
3. Regular inspection of properties.
4. Accident investigations.
5. Proper accident records.
6. First aid facilities and first aid reports.
7. First aid classes.
8. Industrial safety bulletin boards and posters.
9. Contests.
10. Safety meetings.
11. Driver safety.
12. *Safety stunts.*

As headings these do not tell you much that you don't already know as this list seems to follow fairly close to what you might use in a fleet safety program, however, let us discuss each one seperately.

1. *An Analysis of Accidents*—An analysis should be made of past accidents for the purpose of determining where most trouble is occurring. Is it confined to one property or department or is it scattered evenly in proportion to the number of employees? You will probably find that an analysis will show you a number of repeaters. There are some individuals who can no more keep from injuring themselves than some drivers can keep from banging up their buses. An analysis will probably show you that certain types of accidents are giving you your frequency.



A great percentage of industrial accidents can be eliminated by correcting certain physical conditions. *This is* not true of fleet accidents and here is our big difference in approach. If we have a great number of falls, let us look to our flooring, our footwear, our lighting, our housekeeping or whatever is causing the accidents and eliminate the bad conditions. This is easy, all you have to do is repair the floors, see that proper shoes are worn, install more lights or clear out obstruction on the floors and your problem is, for the most part, licked. But you can seldom prevent an intersection accident by repairing some part of the bus.

*Analyze your past accidents now by type,* by location, by severity, by time or by individual.

2. *Industrial Safety Committee*—It is just as important that your injury type accidents be aired in a safety committee meeting as your fleet accidents. A safety committee is just as important to an industrial safety campaign as it is to your fleet safety campaign. If your organization is not too large you will want to have your driver committee discuss the injury accidents. However, if this is done, be sure and have some representation from the shop.

If your organization is larger and you have a separate safety committee or committee, be sure to have your driver personnel represented on the committee or committees. The safety committee should review all inspection reports and decide on any action to be submitted to management for approval. If a suggestion box is used they should pass on the desirability of suggestions offered. Also they should pass on the preventability of accidents.

If a suggestion or recommendation is carried out the person or persons who made the suggestion should be given recognition. If a suggestion or recommendation made, is not carried out, the person or persons making it should also be advised as to the reasons. Once a recommendation is made it should be noted on the minutes of the meeting until a final disposition is made. *That is until it is either definitely rejected* or has been carried through to completion. One thing you don't want to do, is to underestimate the value of a safety committee in the prevention of injury type accidents.

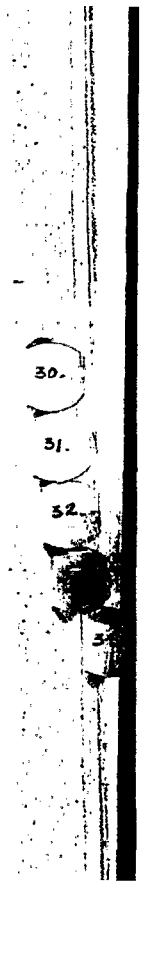
3. *Regular Inspections of All Properties*—Have these inspections made either by an individual or committee appointed by the safety committee or by the safety committee members themselves. Do not use the same inspectors on the same locations year after year, but rotate and change them. Do not belittle or ridicule any suggestions made even though they may appear foolish or impractical to you. This can dampen the ardor of any inspector much more quickly than any one thing you can do. Instead, agree that the recommendation has possibilities but then point out the factors that make it impractical.

Build up the pride of your inspectors. A badge or a pin will make them do a better and more thorough job. Don't steal their fire by beating them to some obvious changes that should be made. By letting them find things that should be done and by even perhaps giving them a few hints you are educating them to do a better job. Supply your inspectors with plenty of literature and show them safety films if possible. This will give them a good idea of what to look for.

4. *Accident Investigations*—You should assist in this as much as possible. These investigations are much more valuable if made soon after the accident has happened. The principal purpose of this investigation will be, of course, to ascertain if some steps can be taken that will prevent recurrence. If so, do not wait until the next safety committee meeting to have changes made, but do it at once.

For accident investigations you also can have either an individual or a committee. It is preferable that you, as safety director, act as chairman of this group. It is possible that, as in some organizations, you will have a safety committee meeting after each accident instead of meeting at periodic intervals. The results, at any rate, of your accident investigation should give you some good meat for special safety bulletins.

5. *Proper Accident Records*—These records will vary according to the size of the organization, however, in general they can be kept in much the same manner as your fleet accident records. With your fleet accident records you have a record of the mileage driven—with your injury records you will have a record of the man hours and man days worked—from this data you can compute your frequency and severity, and compare it with your own and other industries. See Safe Practice Pamphlet No. 21 of the.



National Safety Council for information on how to keep your records and compute your frequency and severity. From your records you should, of course, make analyses for presentation to management. Don't forget that in many cases, a large portion of your job is going to be selling management on accident prevention, and you *can't sell management* unless you have proof in black and white.

6. *First Aid Program*—You can start out by having a first aid station on each property. There should, of course, be someone in charge of this first aid station who has had first aid training. The first aid station is only for the purpose of treating very minor cuts that are not serious enough to go to the doctor or for rendering emergency treatment until a doctor is available.

In all cases where any treatment is made a first aid report should be completed and this should be kept along with other injury records. First aid reports should be scrutinized closely as many times as they bring to light unsafe practices or conditions. By doing this you will be following the old adage that if you watch the pennies, the dollars will take care of themselves. Reduce the number of first aid cases, and you will find that the number of medical and lost time reports are decreased also.

7. *First Aid Courses* are available in most cities through the Red Cross who will furnish instructors. In many instances, instructors can be obtained from your local police or fire departments also. These courses are of great importance to accident prevention, and I am a strong believer in them because of the many instances I know of in which grand results have been attained. The primary course is the one in which you will be most interested and requires 20 hours of instruction or about 10 meetings.

In starting first aid instruction, you will, of course, begin with the supervisory staff and preferably have some of them take the instructors course. The problem of teachers is then taken care of. In your first sessions should also be those who will be responsible for first aid. After supervisory personnel has been given the opportunity to take the primary course, the course should be made available to all other employees. Do not exclude your driver personnel but make a concerted effort to get them interested. Past experience has proven that first aid courses are as much a deterrent to fleet accidents as they are to injury type accidents. I know of many instances where a substantial reduction in fleet accidents has occurred as a result of drivers taking the course but do not know of a single instance where good results were not attained.

8. *Bulletin Boards*, properly placed, are as essential to your employee safety program as to your fleet program. These boards should be put at strategic locations and kept up properly and neatly. You will find as many items of interest to place on this board as on your fleet board. A poster service is also available for it through the Council.

9. *Contests*—Competition has long proven one of the greatest stimulators of interest in a given subject. Everybody likes a contest, be it baseball, football, or safety. You will find that the improvement will be in direct proportion to the interest aroused, so put lots of effort behind it.

Your bulletin board is a good outlet for pep talks to the teams or contestants. Post standings of teams regularly. Make the prize for the winner worthwhile. The results will be worthwhile to you. The negative approach has been used successfully in the past, also. That is, the losing team has been penalized in one way or another—such as giving the loser a dummy which has to be kept on the loser's property until they could be among the winners.

10. *Safety Meetings* can produce results "if"—and I mean—"if they are interesting," "if they are conducted in the proper setting," and "if they give the employee something worthwhile." A meeting which does not hold interest is worse than no meeting at all. A meeting held on the spur of the moment, at some undesirable location or in undesirable surroundings has two strikes against it to start with. A meeting which uses shopworn ideas, or which does not function smoothly will ruin not only the one meeting, but will have an effect on attendance at future meetings.

You can stimulate interest through films, visiting speakers. The National Safety Council has quite a library of industrial safety films available as well as other material that can be used in meetings.

11. *Driver Safety*—Don't forget your driver personnel in your campaign on disabling injuries. A driver can be injured seriously by simply failing to use proper precautions in checking an overheated radiator, thereby scalding himself. There are many ways a driver can be injured aside from the possibility of an accident with the bus. See that driver safety is not neglected by including a driver on your shop safety committee.

12. *Safety Stunts* will help you create as well as maintain interest in safety. There are many that can be used to good effect in your war on disabling injuries. Read Safe Practice Pamphlets 100 and 101 for some ideas which have been tried with success. Think up some new ones of your own.

The National Safety Council has material which will assist you in your employee safety program such as:

Safety Instruction Cards for Employees
Safe Practice and Health Pamphlets
No-Accident Honor Award Pins
A large library of safety films, also safety graphs
Posters and other printed material
Reference library
Accident facts and statistics

You can also enter the Transit Section Safety Contest and thereby find out how you are doing compared to others in the same industry. The Safe Practices and Health Pamphlets alone will give you a wonderful reference library, for instance, you should read at least parts of these pamphlets:



21—Accident records and classifications
13—on abrasive wheels
D6-HP-1 on batteries
48-HP7 on carbon monoxide
56—on classification of accidents, and accident investigation
98—on chain hoists
10J—on electric welding
24—on fire extinguishers
HP-8—on first aid
D-6—on garage safety
14, 106—on goggles
22, 59—on lighting
2—on stairways
39, 76, 41 and others on hand tools and electric tools and many others which will help you with special problems such as your paint shop, carbon tetrachloride, oakite, new construction, etc.

In closing let me say that you can't buy a canned safety program and thereby lick the problem. I have seen programs that had a good many of the aforementioned items in effect and they were a dismal failure. Why? Because the proper effort was not expended to create interest. You can't just start any of these activities, and then just let nature take its course. You must follow up and follow up hard. These words to the old song certainly apply to an employee safety program: "It ain't what you do, it's the way you do it."

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## Employee Accident Records — Their Collection and Use

**By J. O. SPEED**
**Superintendent Transportation, Birmingham Electric Co., Birmingham, Ala.**

To my way of thinking, accident records, in whatever manner they are kept, are just one of the tools in the hands of the safety man and his management. If properly evaluated and used they contribute in large measure to the prevention of accidents. However, if accident information is gathered and recorded merely for the sake of the record *itself it is not only* worthless, but is a colossal waste of time and energy that should be directed to more productive work.

I do not under-estimate the value of good record keeping in the prevention of accidents, but to me the type record that provides the maximum of information, with the minimum of paper work, is best. I have known some safety men who became so bogged down in a maze of intricate accident records that they had no time left to prevent accidents, and they wondered why their frequency didn't come down.

Of course there are several reasons why we keep accident records. One is that we

must be always ready to furnish reams of statistical data to the various sections of the National Safety Council. Then there's the American Transit Association, and the federal government, and the state government, and the claim department and others *ad infinitum*. But regardless of the information we record somebody always asks for some that we don't keep. But after all, the primary purpose of the accident record is the prevention of future accidents. And how may they be used for this purpose?

Let's start at the beginning with the accident report itself. Contrary to the belief of some, the purpose of the accident report is not to harass the foreman nor to be a stigma on the work record of the injured. The one great over-shadowing purpose of the accident report is to record, for the information of those concerned: how the accident happened; when the accident happened; where the accident happened; and most important of all; why the accident happened. These things are basic. They are the frame-work on which defenses against a recurrence must be built.

To obtain this information on the accident report is many times difficult. First, the accident report form must be so designed that the report is not complete until all of this information is furnished. This can be done in several ways, and in every case it must be designed to conform to local situations. Second, the personnel responsible for making up the report must be properly trained. This type of accident report requires an investigation of the accident, and untrained personnel cannot investigate accidents.

Armed with an accident report on which the essential data has been recorded the safety man is ready to build his first line of defense. With the help and cooperation of the proper operating heads the cause of this particular accident will be found and a safe way devised.

The next step is a form (call it what you may) on which the information from the accident report is recapitulated by departments, sections or divisions. This form should reveal, at a glance, the comparative accident experience of the sections and departments. It should indicate the types of accidents properly classified as to causes. Such information will enable the safety man and the management to sharp shoot their accident causes. It will show to the safety man the points where his help is most needed, and will indicate to the management the particular section heads that need their attention.

There is another record that I like to keep. The good, safe workman is proud of the fact that he has no accidents, and he likes to have his name published annually with the statement from the Company that he has worked one, two, five, or ten years without an accident. I consider that it builds good employee relations to keep a file on the accident experience of the individual employee. This can be a simple card, bearing the employee's name and department, with space provided to record his accidents by date, type, nature of injury and lost time. This file also provides the safety man ready references to "repeaters" and enables him to concentrate on such men and endeavor to bring them in line.

## Accidents Can Be Helpful

(A Panel Discussion)

*Discussion Leader:* H. W. Whitcomb, Superintendent, Accident Prevention Department, Philadelphia Transportation Company.

*Participants:*

Milton M. Bowman, Supervisor of Safety Prevention, Cleveland Transit System.

F. E. Mottweiler, Safety Director, The Memphis Street Railway Company.

F. E. McCollom, Safety Director, National City Lines, Chicago, Ill.

R. H. Daily, Safety Engineer, Surface Transportation System, New York, N. Y.



CHAIRMAN WHITCOMB: When we say "Accidents Can Be Helpful" we are speaking particularly of those "near misses" where no one was seriously hurt, but where someone could have been killed.

So many times when inspecting the industrial side of it, we think only of accidents as injuries. We do this because we have been so used to that in computing our frequency rate on lost time injuries, where if the fellow doesn't come back for his next shift, it is a lost-time accident, and it is counted in the rate. We try to get a report on every last accident even if it is only a first aid case.

In three of our shops, we have a full-time nurse attending and giving first aid. It is very difficult to get operating people to give us reports on that. Our superintendent of shops, Frank Heinman, used to fight with me because he said, "We take care of these trivial things. We take something out of an eye. We patch up a finger with a Band-Aid. Why do you want to know all about that stuff? We are too busy to truck with that stuff. It takes up a clerk's time to make out these reports that you want." So we like to keep the reports simple, because the operating people will not make out a complicated report.

So, over the years, Frank would say, "I am not going to report these accidents any more. We are too busy and we don't have enough clerks. We don't have enough men." And of course, my argument with Frank was, "Frank, don't have the accidents, and you won't have to have all the clerks. We don't have to have all the reports. But, it is only in getting a complete picture of what goes on that we can hope to keep industrial injuries from getting into the lost time column."

Many of these minor injuries could have been much more serious. I think it is very important that you have a complete report. Only when these so-called minor accidents and "near misses" are reported can "Accidents be helpful."

Now, what is an accident? Well, the dictionary says that "an accident is an event that occurs without one's foresight." We like to think of it from the standpoint of accident prevention as an event that occurred because someone's foresight wasn't used. If we could know about these things beforehand and make some plans to prevent their occurrence, we could certainly minimize our exposures.

I know some of you have been close readers of Heinrich F. Ballard, who set up the "bible" on industrial safety. He gives us a story that points out what can be learned from studying accidents. It was made after studying hundreds of thousands of accidents of travelers' compensation cases. He says that out of every 330 unexpected events, only one results in a disabling injury, 29 in a minor injury and 300 in no injury at all.

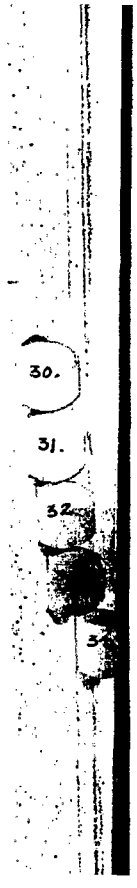
If we don't find out about the 330 events involving hazards a lot of fellows will have to find out about them by having costly accidents. They have just been very fortunate, but any day that one accident out of 330, as it mathematically figures out, may happen. So, out of 330 wrong acts, we have one serious accident.

I have a full-time safety man who contacts all our men in 65 departments once a month. We investigate the accidents that happened in the interim since the last time we were out. We make a shop inspection at that time, either with the shop supervisor or if he is too busy, he says, "You go out and take a look and come back and tell me what you saw." We have a form we leave with him, giving him a clean bill of health or some recommendation. We present him with an opportunity (until the next inspection) of doing something about the recommendations, or if it is a serious hazard, we get after him by telephone more frequently during the interim of one month.

We first give him an opportunity to do something about it himself. If he finds he can't do anything about it himself, then he might say to us or we might say to him, "What do you want us to do?"

He says, "I can't do anything. It is going to cost $100 or $150. I can't get the boss to do it. You take the ball and see if you can get him to do it." So, it is only when the shop supervisor gives up or corrects the thing that we go to his immediate superior.

We enjoy that kind of a relation with our people in the shops, and so sometimes they have called matters to our attention which show that accidents can be helpful. Some incident may happen, and they say, "Don't tell anybody I said anything about this situation, but here is something that



happened the other day." It was an accident, sure enough, but nobody was hurt, and you would never know about it unless he told you, and he does that because he is interested in your program.

Not too long ago two of the top men in the operating department happened to be down on the pier where we bring in some special work on the Delaware River. They were underneath a suspended crane load. They were looking up, inspecting it from the bottom. Of course, the instructions are that you stay out from under a suspension load, but that never applies to top supervisory people. They always do things the way you wouldn't want them to do it.

They were standing there, looking up and one said, "Is it all right?"

The other one said, "Yes."

Then they stepped out and just then the hook bent and down came the crossbeam. One fellow's trousers were torn, but they both could have been killed except for a fraction of a second.

One of the fellows much lower down called me and said, "This is the situation, Harry. We ought to do something about it. Don't say I said so, because I might get fired because they wouldn't want you to know *they did such a thing.*" So many times, if you enjoy the proper relations with these fellows, they will give you things they could hide from you if you were doing a punitive job of whispering and snooping.

It is the same with reports of minor injuries. If we have reports, we can investigate and see what caused them. Why did something get in the eye? Was it that they didn't wear goggles? What caused the toe injuries? What caused the slips and falls?

It is only by normal channels of making the proper cause analysis and investigation that we can prevent a reoccurrence. If we waited for serious accidents, we wouldn't have much material to work with, but these incidents, such as minor injuries, first aid treatments and so forth should be reported. We should know about them in spite of the paper it takes to write them out and the clerical work involved. I think it is a very important part of an industrial safety program.

Unfortunately, sometimes it takes quite a serious accident to get people to spend money. We have had things that we have recommended time and time again that might cost up in the thousands of dollars. Potentially, it is a serious exposure, but they always say to me, "Well, what has been our experience? Have we had any accidents? How much has it cost us in compensation costs because we have this condition existing?" They want to balance what they are going to spend with what it is going to pay them.

It seems to me, if you are doing accident prevention work, you ought to try and develop exposures whereby spending a few dollars you can save some money in the future—not spend money on top of money you have already spent as a result of those accidents. But many times, we rather wish, and this may be a little sadistic, we would have one rather bad accident where the fellow wouldn't be crippled for life, but something that we could use as a whip to call attention to it and get the money necessary to correct the unsafe condition.

As soon as a serious accident happens, they all throw up their hands. They start to holler and condemn. They come down on us, and we have to be, "I told you so" people. We get a lot of stuff out of the files and say, "In 1943, 1944, 1945, 1946 and 1947, we brought this to your attention, but you said, no, no, no, no spending. And now we have had the accident and it has cost us some money and everybody is in an uncomfortable position. Now you want to do something about it."

You are required by law in the State of Pennsylvania to have a net under people working overhead at certain heights. We do some painting of our own elevated structure where it goes across the Susquehanna River. During the war, we weren't hiring structural steel painters, but merely ordinary painters.

Painting structural steel up in the air is something different from painting a fence on the ground. We invoked this rule of the State of Pennsylvania, which says you must have a net suspended under men working overhead. And then they said, "You are perfectly ridiculous. By the time we paint it, get the net made and everything, it would cost us about $1800 for the net plus the additional work of moving the net as the job progressed."

However, I was able to get my boss and a couple of other fellows worried about the possibility of someone being killed. So, we finally got a net. One fellow fell off the elevated structure on the second day. He was married. A young married man with three or four children. He would have cost a great deal in compensation. He was caught in the net and wasn't injured at all.

Some of the people around the company said they thought I had actually pushed the fellow into the net, or given him five or ten bucks to fall into the net. But this near miss drove home a point. This kind of "accident" can help prevent future tragedies.

The National Safety Council puts great stress on fatal accidents. They don't scare me at all. What caused the accident is the important thing and not whether he died or not. Severity as was so well said, isn't the important thing. It is the frequency.

*MR. MILTON BOWMAN: The chairman asked me to cite some accidents that would be helpful.* I could tell you about a few fatalities and accidents that happened here in Chicago many years ago . . . my steam railroading days. If it were not for an accident, I wouldn't be here today. That accident incapacitated me, [illegible] I couldn't return to railroad service.

I went over the 28 years of organized safety on the Cleveland Transit System and saw many an instance where these accidents happened, and where we have profited by these accidents.

It certainly pays to stop, look and listen. I can tell you from personal experience. If anybody wants to know how much more I know about an injury than they know, well just wait until this session is over and I will strip and show you fourteen marks on me from an accident.

When I accepted my present position in 1945, my assignment was to spend 90 per cent of my time in transportation and 10 per cent of my time in the miscellaneous departments looking out for the personal injury situation. That was the wish of our Central Safety Committee. My time in the interests of miscellaneous accidents has increased and my time is divided now, 65 per cent of it in transportation and 35 per cent in the personal injury field.

I have selected five cases which I will go over in the five or six minutes which I have to talk to you. First, a case that happened in November, 1945. It happened in one of our car yards when one of our yardmen was bringing up the third two-car train on track 7 and for some unknown reason one of the new men got on the four train and brought her up. Not knowing about the matter of air and such, he found that he had to back the car, but he became panicky and lost control and rammed into the third train. John Bernadino had walked around to the head end of the third train and was crushed between the lead car and the trailer.

'We had an order in effect that no one was to get on the cars and move them who was not qualified, but for some unknown reason, in a moment of enthusiasm or wanting to play motorman, we don't know which, it was done. Nevertheless, we have reemphasized and constantly checked on the movement of equipment. Only those who know what it is all about are permitted to move it.

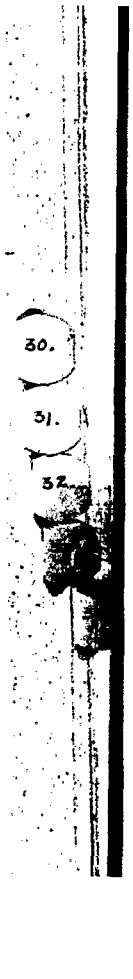
I would like to emphasize the importance of having only qualified personnel move equipment about your yard. Make that rule stick and check it frequently.

At the present time, all of our men take a two-day training course in the moving of equipment.

One of the accidents caused all of us to blush. This accident happened about two years ago when we had three operators fall in a pit in less than twenty-one minutes.

At five fifty-two a dispatcher ordered an operator to take out Coach A-64 which was in House No. 3. After getting his supplies, he hurried through this station where we had just broken in the floor in order to add another open pit. We had taken every precaution. There were coaches parked on the pit. There was a red light there. The overhead lights in the station were lighted.

Every one of these operators was warned by the dispatcher to look out for the open pit. This operator went through the regular way and fell into the pit. We got him out and into a police ambulance, but by that time, another fellow came through and fell in, and then, believe it or not, a third one did the same thing. It all happened in twenty-one minutes. I am still embarrassed when somebody asks me if they have covered the big open hole in Cleveland where the three fellows went in. So, you can't take enough precautions.



But, *that accident was helpful*, because fortunately there were two slight ankle injuries and a bruise on the right elbow and a head bruise and that was about all. Believe me, in our safety committee, we are pit conscious, and we are hopeful that today we may hear more about pits here. We feel in our new construction and converting our old into the newer methods, we have solved many of the problems of the pits by proper illumination, and also good housekeeping.

Since our system is municipally owned, we have no setup to buy and sell shoes to our people. So, I went to work and found means whereby a mobile unit could go out to the property or the track gang and fit the shoes. I issued bulletins from the Central Safety Committee, but I only received one nibble on that suggestion. It wasn't until we worked out channels whereby we could get those safety shoes for our people properly fitted at a price that is within reason that it worked.

Two days after a carpenter in the magazine department had been fitted with his safety shoes, a magazine fell on his foot. The sharp edge of it, weighing nine pounds and some ounces, hit that safety shoe and cut into the leather, denting the toe. We made capital out of that. We are still publicizing about Wagner and his foot, and it has helped us materially.

I think the only way you can solve the shoe problem is to take the shoe department out to the workman and let every man see the shoes.

Just the other day, the boss in the dumpers, handling the heavy oxygen magazines and so forth, and his whole crew came in and asked to be fitted with safety shoes. We are now working out the channels for them to be fitted on the spot.

Eye protection is a subject that is near to my heart. We have a preponderance of cases of foreign bodies in the eye which disturbed us greatly, so we asked each department what they were doing about goggles.

During the war, we became somewhat lax in eye protection. In order to remedy this situation, we called in all the goggles being used in every department and laid them on the table of our Central Safety Committee with the latest types of goggles. There were two choices for each one of our occupations. This was after the hazards had been carefully studied. I wanted to give our men the choice of two types of goggles for each particular job. However, we had some difficulty at the time, our financial situation not being as healthy then as it is at the present.

We went further than that. We took a troubleshooter from each department and had him in for three sessions of two hours each, working with the experts on fitting goggles. Our aim was to issue a pair of goggles to every man who was working there. These troubleshooters are in working with the boys. Whether they are track gangs, power gangs or what-have-you, they talk the language about whether it is a good fit or not. We equip them with those little gauges and an artificial eye and in this way dramatize the thing. Then, if a man has difficulty wearing plain safety glasses he has written instructions on how to proceed to have a correction ground into the safety glasses.

I have three cases that happened within thirty to ninety days of the beginning program.

A man working on a trackless trolley touched the switch and something happened that you electrical people know more about than I do. Something gave way, and molten metal splashed over his glasses. Had it not been that his prescription was ground into that glass (because Myron couldn't see well enough with plain glasses) he would have been blinded in both eyes. The same thing applies to a welder here and also to a boy working on granite blocks. I have used our house organ and every other possible means of getting Myron's picture with his glasses and statements publicized.

Those accidents were very helpful in our goggle program.

Our stores department was greatly disturbed when it began handling the extra and added duty truck tires and heavy equipment which are involved in the great job of conversion that is going on in the transit system. They were disturbed because the number of hernias increased by about three times over what they had had in the five previous years. To remedy this we experimented with a hydraulic lift gate which worked out very satisfactorily. The gate was so successful that we have it installed or ordered it to be installed on two more trucks, and two new trucks that are ordered will be equipped with these lift gates. The psychological effect and practical effect on the lifting problem in your property is wonderful.

When we have a preponderance or an increase of a particular type of accident, we thought it well to make a complete survey of our entire property from attic to basement, machine to machine, pit to pit and station to station. It will take you a long time to do it, but by devoting say a day or two days a week, it can be done. We did it in conjunction with the Ohio Industrial Commission which was equipped with the necessary codes and the particular occupations throughout our property. I just finished such a complete survey, and it has taken me a year to do it.

We uncovered 207 safety recommendations and 82 per cent of those have been put into effect up to date. We feel that an over-all survey, an over-all inspection, particularly with your state inspectors, your Department of Labor is of psychological and practical value.

CHAIRMAN WHITCOMB: Our next panel man is Mr. Mottweiler, Director of Safety, Memphis Street Railway Company.

MR. F. E. MOTTWEILER: We had a couple of accidents in Memphis that we felt helped us to reduce accidents. One of them is an accident which I feel a lot of us are overlooking and that is, ladder accidents. I will read you the accident report:

"I was on a ladder cleaning the overhead motor in the carpenter shop. The ladder slipped on the concrete."

This man didn't have anything to grab, so he jumped to the floor and injured his ankle. He was off 22 days, and it cost the company approximately $170.

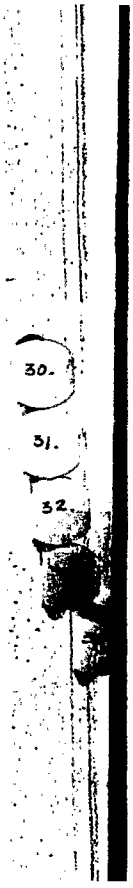
Now, upon investigation of this accident, we found that the man was using a new ladder and that the person responsible failed to put safety shoes on the ladder. This accident brought about a very rigid inspection of our ladders—the storage, painting and the various things that should have taken place before the ladder was put into use. That accident was helpful. The men are on the ball now to see that all of these ladders are properly inspected. Ladders out of working order are tagged and immediately taken out of use.

The second accident was one in which an inspector of electric coaches was seriously hurt. We have just converted all of our property from street cars to electric coaches and buses. Everything we have is on rubber tires. You can see what a problem we have with our new equipment.

This inspector was working in the rear of one of the electric coaches. There was another inspector working on the coach immediately behind him. This second inspector was not doing his job in a safe manner. First of all, he did not have the emergency brake on. He had the strings off the controller, and the controller switch was on. After he had finished working, he jumped out of the coach and ran around to the back and put the trolleys on the trolley wire. The man working in the rear of the first coach was immediately crushed between the two coaches. He had a broken pelvis' bone and a lot of minor injuries. That happened about four years ago. The injured man was in a very serious condition when he was sent to the hospital, and as yet, he has not been released for fulltime work.

A number of regulations were immediately put into effect as a result of this accident. Putting chocks under wheels is now a requirement. You know that all people do not follow the safety rules. We had another accident of a similar nature where this person failed to put the chocks under the wheels. A coach rolled from a dead stop, 37 feet into an employee. We were at that time, building a new wash rack to wash our coaches and buses. We had several men working over a coach on a brick wall. If the coach had moved two or three feet in either direction, it would have killed four or five of these people. So now, we have put into effect a system where we have two inspectors working on each coach. Those inspectors will work together. And, they will not work on any other line. We have our lines numbered from one to twenty-four. We have each inspector working on various lines. But, in the past, we had one inspector work on Line 24 and then he would move over to Line 23. But now, he will work on Line 24 all the way down, with the two inspectors, and we are hoping that we will eliminate a few of these accidents because this accident cost us approximately $1500 just for damages to the coaches, not including the lost time of an employee.





But, *that accident was helpful*, because fortunately there were two slight ankle injuries and a bruise on the right elbow and a head bruise and that was about all. Believe me, in our safety committee, we are pit conscious, and we are hopeful that today we may hear more about pits here. We feel in our new construction and converting our old into the newer methods, we have solved many of the problems of the pits by proper illumination, and also good housekeeping.

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Eye [illegible] my heart[illegible] cases of fore[illegible] disturbed us greatly, [illegible] each department what they were doing about goggles.

During the war, we became somewhat lax in eye protection. In order to remedy this situation, we called in all the goggles being used in every department and laid them on the table of our Central Safety Committee with the latest types of goggles. There were two choices for each one of our occupations. This was after the hazards had been carefully studied. I wanted to give our men the choice of two types of goggles for each particular job. However, we had some difficulty at the time, our financial situation not being as healthy then as it is at the present.

We went further than that. We took a troubleshooter from each department and had him in for three sessions of two hours each, working with the experts on fitting goggles. Our aim was to issue a pair of goggles to every man who was working there. These troubleshooters are in working with the boys. Whether they are track gangs, power gangs or what-have-you, they talk the language about whether it is a good *fit* or not. We *equip them* with those little gauges and an artificial eye and in this way dramatize the thing. Then, if a man has difficulty wearing plain safety glasses he has written instructions on how [illegible] proceed to have a correction ground into [illegible] safety glasses.

[illegible] three cases that happened within [illegible] ninety days of the beginning

Our stores department was greatly disturbed when it began handling the extra and added duty truck tires and heavy equipment which are involved in the great job of conversion that is going on in the transit system. They were disturbed because the number of hernias increased by about three times over what they had had in the five previous years. To remedy this we experimented with a hydraulic lift gate which worked out very satisfactorily. The gate was so successful that we have it installed or ordered it to be installed on two more trucks, and two new trucks that are ordered will be equipped with these lift gates. The psychological effect and practical effect on the lifting problem in your property is wonderful.

When we have a preponderance or an increase of a particular type of accident, we thought it well to make a complete survey of our entire property from attic to basement, machine to machine, pit to pit and station to station. It will take you a long time to do it, but by devoting say a day or two days a week, it can be done. We did it in conjunction with the Ohio Industrial Commission which was equipped with the necessary codes and the particular occupations throughout our property. I just finished such a complete survey, and it has taken me a year to do it.

We uncovered 207 safety recommendations and 82 per cent of those have been put into effect up to date. We feel that an over-all survey, an over-all inspection, particularly with your state inspectors, your Department of Labor is of psychological and practical value.

CHAIRMAN WHITCOMB: Our next panel man is Mr. Mottweiler, Director of Safety, Memphis Street Railway Company.

MR. F. E. MOTTWEILER: We had a couple of accidents in Memphis that we felt helped us to reduce accidents. One of them is an accident which I feel a lot of us are overlooking and that is, ladder accidents. I will read you the accident report:

"I was on a ladder cleaning the overhead motor in the carpenter shop. The ladder slipped on the concrete."

This man didn't have anything to grab, so he jumped to the floor and injured his ankle. He was off 22 days, and it cost the company approximately $170.

Now, upon investigation of this accident, we found that the man was using a new ladder and that the person responsible failed to put safety shoes on the ladder. This accident brought about a very rigid inspection of our ladders—the storage, painting and the various things that should have taken place before the ladder was put into use. That accident was helpful. The men are on the ball now to see that all of these ladders are properly inspected. Ladders out of working order are tagged and immediately taken out of use.

The second accident was one in which an inspector of electric coaches was seriously hurt. We have just converted all of our property from street cars to electric coaches and buses. Everything we have is on rubber tires. You can see what a problem we have with our new equipment.

This inspector was working in the rear of one of the electric coaches [illegible] another inspector work[illegible] immediately behind [illegible] spector was not [illegible] manner. First [illegible] emergency b[illegible] off the cont[illegible] was on. [illegible] he jumpe[illegible] to the [illegible] trolley [illegible] of the [illegible] betwee[illegible] pelvis' [illegible] That [illegible] injure[illegible] when [illegible] yet, he [illegible] work.

A num[illegible] ately put [illegible] cident. Pu[illegible] a *requireme*[illegible] do not follow [illegible] another accident [illegible] this person failed [illegible] the wheels. A coach [illegible] stop, 37 feet into an empl[illegible] at that time, building a new wash rack to wash our coaches and buses. We had several men working over a coach on a brick wall. If the coach had moved two or three feet in either direction, it would have killed four or five of these people. So now, we have *put into* effect a system where we have two inspectors working on each coach. Those inspectors will work together. And, they will not work on any other line. We have our lines numbered from one to twenty-four. We have each inspector working on various lines. But, in the past, we had one inspector work on Line 24 and then he would move over to Line 23. But now, he will work on Line 24 all the way down, with the two inspectors, and we are hoping that we will eliminate a few of these accidents because this accident cost us approximately $1500 just for damages to the coaches, not including the lost time of an employee.

CHAIRMAN WHITCOMB: Our next safety expert is Mr. F. E. McCollum, Safety Director of the National City Lines, Chicago.

MR. F. E. McCOLLUM: When I was first asked to appear on this panel with the subject title, "Accidents Can Be Helpful," I frankly had to scratch my head a little. The subject itself sounded ambiguous.

My definition of an accident is an unfortunate incident. To say then that an unfortunate incident can be helpful is confusing. It remains so until an explanation is made of who is helped or until we determine if the degree of help exceeds the degree of harm. To be helpful, someone must benefit by the fact the accident occurred. The eligible benefactors are:

A. The employee or employees involved.

B. The other employees.

C. The employer.

The *employee or employees* involved benefit only when they learn through the accident that it pays to be safe; that had they done differently, the accident would not have happened, and how they could avert a similar occurrence.

*Other employees* benefit only when someone else lets them know what to expect and how to conduct themselves so they, too, will not be hurt or be involved in an accident.

The *company* benefits in that they may reduce the frequency of accidents through knowledge of what has happened and inaugurate steps to prevent a reoccurrence.

Our company, National City Lines, recognizes the importance of taking such necessary steps. We operate out of our Chicago headquarters, 29 individual or separate operating companies. These are city transit lines, operating buses only. Since accidents from all 29 companies clear through the Chicago safety department, we have the advantage of using the experience gained from one to help avert similar accidents to the other 28.

Let us trace through the steps taken following a serious accident we experienced July 6, at one of our larger properties. In describing the accident, I quote from a letter submitted jointly by our transportation and maintenance superintendents.

"We experienced a very serious accident involving one of our shop employees last evening in the parking lot back of our garage. The accident occurred about 6:45 p.m., while a utility man was gassing and parking buses. Our operator was turning into the garage off a tripper run and had turned north on 8th, north off of J Street, to a point about 50 feet north of J, where he crossed over the sidewalk and entered the parking lot with bus number 1256. He states he went over the crosswalk to a point approximately 50 feet from the gas pumps. The utility man gassing bus number 1280 motioned him to pull in directly behind 1280, so it would be handier for him to service bus number 1256.

"The bus operator in his statement stated, 'I was moving at a normal speed when I crossed the sidewalk and was coasting downhill in a westerly direction towards the gas pumps.' About fifteen feet before reaching the point of contact, he applied the brakes. In addition he applied the hand brake, and in his opinion slid the rear wheels for a short distance in the loose gravel. The left front corner of bus 1256 hit the left rear corner of 1280, as bus 1280 was at a 30 degree angle relative to bus 1256. As the bus was parked at an angle and the corners of the buses hit each other, they absorbed a considerable amount of the impact. However, the utility man was caught between the buses in such a manner as to crack his pelvis bone in two places, breaking one leg at the hip, breaking several ribs, and rupturing his bladder. The operator got out of the bus and went to his assistance. He laid the lad on the ground and came into the garage and called for help. Two of the three garage employees were on a road call and the third did not hear him call. He then went to a telephone in the shop and called the ambulance. After that, he went up to the drivers' room upstairs to get assistance. While upstairs, he called the company doctor and he and one other employee then returned to the yard to do what they could for the utility man. Almost immediately, the ambulance arrived and took him to the hospital.

"It also developed some time after the accident, bus 1256 caught on fire due to a short caused by the impact. Not too much damage was done to the bus. The only damage experienced was to the wiring. The fire was extinguished with the aid of a fire extinguisher and the aid of the fire department."



Our injured employee, in his early thirties, is expected to recover fully. However, it will take an estimated twelve months, at considerable pain to him and high cost to the company, through insurance claims and. The accident has been thoroughly investigated. Human failure has again stepped into the picture. Safety regulations have been violated in that the coach operator should not have approached the parked bus until the utility man was safely aside, out of harm's way. He should have had the coach under control, to insure stopping in sufficient time.

The utility man was violating a safety regulation in not stepping aside as the other coach approached. Past experience has taught us that established regulations on the handling of coaches and on maintenance practices sometimes become so much a part of routine, that they are forgotten. We then reissue, add to, or revise these regulations, stressing only those rules needed to overcome these currently hazardous conditions or practices. This accident is a good example.

We, therefore, have issued a new set of instructions, stressing ways of overcoming the reoccurrence as follows:

1. A complete stop shall be made before entering or leaving bus yard or garage.

2. Coaches will not be operated in excess of five miles per hour in bus yard or in excess of three miles per hour in garage.

3. Any employee will stand aside when coaches are being moved in front, behind or parallel to the coach on which they are working, to insure their not being caught between the two vehicles.

4. Coach operators will not approach another vehicle without first being sure any other employee, who might be between the coaches, is to one side and out of harm's way.

5. Three short warning blasts of horn will be given before backing a coach, either in the bus yard or garage.

We believe from past experience, that by publicizing the incident and applying the rules to overcome the situation an accident can be helpful to the employees and company. For example, six years ago, a review of our record shows an accident wherein a mechanic working on an engine at the rear of a coach was caught in the fan when another maintenance man started the motor. "Danger—Do not start motor" signs were supplied to all garages for use when working on coaches. We have enforced the rule to demand the use of these signs, and it has worked.

Another type of accident occurred some time ago when one of the mechanics narrowly escaped serious injury as the top of a fire extinguisher, of a dry chemical type with a pressure cylinder inside, blew off, due to the failure of properly matching threads when putting tops on after inspection. A bulletin has been issued warning of this condition so other properties will guard against this possibility.

I could cite several other instances wherein we have, as a result of an accident, been able to uncover a condition which possesses an accident possibility. Naturally, we prefer to cover these on the minor accidents and make corrections before a major one occurs.

An accident can be prevented only when the warning given is heeded. That, I believe, is the purpose of this Safety Congress, to get us to heed the warnings and become safety conscious.

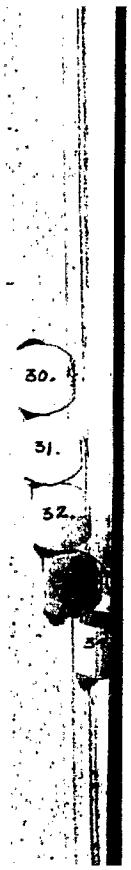
CHAIRMAN WHITCOMB: Our next panel member is Richard H. Daily, Safety Engineer, Surface Transportation System, New York, N. Y.

MR. R. H. DAILY: We have heard a lot of stories this afternoon that are based on the fact that we have to have an accident before we are able to remedy a particularly hazardous situation. In my particular case in New York City, I had more or less of an ultimatum that we had to get results in six months or else. As safety men, we can usually expect that when we go into a company.

When Mr. Whitcomb said just a minute ago that accidents can be helpful, I wondered, "How can they be helpful? We are trying to get rid of those things right now."

But if we stop to think about it, if we want to get to accident reduction quickly, we must, first of all, make a quick survey of the accidents that are happening and that will give us a pattern or lead to do away with them.

The first thing I faced in New York City was the fact the company was having ten



thousand accidents every year, and sometimes up to $3,500,000 in claims. Accidents were happening in 45 different properties, so we knew that we had to get started fast.

We found that accidents could be helpful. An operator came in one day and made a report on a rear end collision. These accidents were happening faster than we could count them. In order to reduce them, we had to find out just what was going on. We had a faint idea that operators were probably following too close, but this operator's report said:

"I was following a vehicle by 25 feet. I was going 20 miles an hour and I should have had ample room. He stopped quickly in front of me and the accident occurred."

It was just as simple as that, and it was written as though it were something he had been doing for years and he couldn't understand why it happened. But, we had a selfish idea. After all, this particular operator was injured, and that is one of the quickest ways to get the story over, to tell them a personal injury. We had seen so many of them injured and hurt in the past and we wanted to do everything we could to cut down the accidents, because it really involves them and their families.

We were lucky in that particular instance to have the union chairman with us, and we hustled him into the picture. We put on detonators. We knew we were going to have to prove that he was following too closely. We put the detonator on the bus and proved to him that with a loaded bus it would take him all the way from sixty to seventy-five feet to stop when going at the speed of 20 miles an hour. There was no use in his trying to kid himself into thinking he could stop within a twenty-five foot distance.

We started our safety refresher school for the purpose of taking care of 181 men that were repeaters. Out of 2,100 operators, 181 individuals had a third of the 10,000 accidents. There was no use in wrestling with the problem involving all the men. We felt we should get to these 181 men. We found out they were having twice as many rear end collisions. A lot of operators were being injured. General Motors told us they were putting on more new front panels for us than any bus company in the country. We were ashamed of it.

We began a school in which we told the operators what was happening as a result of their following too closely, what distance was necessary to keep from having accidents. We also showed them how to prevent accidents of that kind, since 99.9 per cent of those accidents were not necessary and could be eliminated. We set up the National Safety Council rules, with the intention of stamping out rear end collisions as quickly as possible.

You know what misery and money can be spent on a rear end collision. There is nothing a safety man hates more or that will burn him up quicker than to know his men are having rear end collisions. It's disgraceful to him, to the public, and it certainly doesn't help the record one bit.

In rear end collisions you have many claims. The person in front has injuries that are covered and hard to define. Moreover, the operator usually gets hurt, because many of these buses fold up like crackerjack boxes once they hit something in front of them. They don't have as much protection as the old trolley car.

In our school, we use a detonator loaded with cartridges and powder. We demonstrate on the floor of the class. That has a twofold purpose. It shows the drivers that they had to have a certain following distance and it woke them up when they got sleepy. We didn't say that it was necessary to have a detonator on the front of our buses. We found out it was just as effective to have it on the floor of the school and watch them open their eyes when they saw what was going on in front of them.

We had 181 men educated overnight about rear end collisions. They didn't know what was causing them up to this time. They found out by the time you got the reaction time and added it on to the actual braking distance, it took 65 or 70 feet to stop and as a good formula, we used one vehicle length for every ten miles per hour. We put the posters all over the system and told the boys to deal with them firmly.

We set up an accident system where an operator could only have two accidents in a two-months period, and we worked that right in with the program. When they had the first accident, we brought them in for retraining and a refresher course and sent them out with an old operator on the bus to find out what weakness they had.



We knew that rear end collisions were the ones we had to work on. We eliminated 75 per cent of our rear end collisions in a two-months period. I never say anything work as fast. And now you should see the operators come in and talk to us when they had an accident where they don't do half as much damage. Maybe they slip into the bus ahead a little bit. They take this thing very seriously now. They try to keep from having rear end collisions.

We tell them of accidents we want to avoid. We are going to have to watch them. We told them they had to keep rear end collisions in mind all the time and remember they had to keep at a safe following distance.

How can we keep that safe following distance when some driver cuts in front of us all day long. The best thing is to get into the habit of doing the same thing the trolley operator does. Power on, power off, all day long. It makes a person work to do it, but it does get results, and with a bus all you have to do is take the foot off and put it back on the accelerator. As somebody passes the left hand mirror and pulls out in front, the operator can push his foot down and stop in about as short a time as the fellow in front.

We took off 900 trolley cars and put in a thousand buses and our old motormen, who were exceptionally good trolley operators, were having trouble the first month with the buses. What were they doing? They were getting themselves injured. They were sliding on those terrible cobblestones in New York City. I have never seen anything like it in my travels across the United States.

The first thing we did was to make a study of why these fellows when coming over the Washington Bridge went into a slide at the intersection. There is a yellow light at the center of the bridge. We told the drivers that they should start braking when they saw it come on. The boys were missing the yellow light, and as a result when they applied their brakes they would keep on going. They wouldn't know whether they were going to end up against the intersection or the Empire State Building.

After two or three of these accidents happened, we brought the operators into the school. We rode with them, and we sent our men out in the buses to show them how far ahead they had to apply the brake so they wouldn't slide into the intersection.

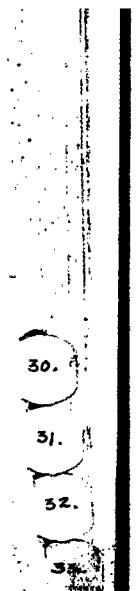
We had a selfish idea there. We told them that they were injuring themselves, and we were going to try to do everything we could to prevent them from doing it.

There are other accidents that you know about that are problems, too. We eliminated about 25 per cent of the skidding accidents and 50 per cent of the rear end collisions. We have eliminated about 50 per cent of the sideswipes. Pulling away from bus stops hundreds of times each day causes a great problem to the operator. Think of the exposures he has all day pulling in, pulling out, worrying about the pedestrian crossing, the people crossing against the red light and everything you have to worry about when you come to the intersection.

We found out our operators were not adjusting their mirrors properly when they left the garage in the morning. Although they checked their mirrors, they would go out and get hit and say, "Well, there is a blank spot in it." I found out years ago there is a blind spot, if it is not adjusted properly.

We brought the operators into the school and taught them the 1, 2, 3 mirror method in reducing sideswipe accidents. We told them before pulling out, to check the mirror once, and then turn the head to the left. That takes care of the little Austin or automobile that might be right against the blind side. Then, turn the head to the mirror again. By that time anything that is coming is past. Then, they could pull out cautiously and carefully.

By doing that 1, 2, 3 system we have eliminated a good 25 per cent of our sideswipes, and 50 per cent of our accidents are probably sideswipes anyway. So, by cutting those down 25 per cent and cutting the rear end collisions down 75 per cent and working on the skidding accidents and getting them down 25 per cent, we were able in a nine-month period, to get a 35 per cent accident reduction last year. In the last thirteen months we had 2,700 fewer accidents and the company saved $75,000.



# Use of Safety Council Materials

By J. S. OSBORNE
Superintendent of Transportation, Cincinnati, Newport & Covington Railway Co., Covington, Ky.

Last year when I attended the meeting here in Chicago, I had with me Lum Edwards, the Vice Chairman of our Safety Board. The remarkable thing about this, I think, is that Lum is also an official of the Union. As we sat and listened to some of the talks, I got a very distinct impression that had some of the speakers known that a Union official was present, some of the things may not have been said. There was no cause for concern, however, because Lum is a broad-minded Union official, as you will see, and a theme of Union-Company cooperation pervades the whole safety program on our property. For the information of you who are not acquainted with our company, and since the matter of physical make-up of a company is a determining factor in its safety program, I would like to give you a brief description of The Green Line.

The C. N. & C. Railway Company, better known as the Green Line, serves all of the Northern Kentucky portion of the Greater Cincinnati area. This area consists of 18 cities and towns of varying sizes and traffic regulations representing a population of 145,000 in the 1940 census. With our wholly owned subsidiary—The Dixie Traction Company, we engage in a wide variety of transportation services, including local city lines, suburban type service, airport limousine service, charter, and even over-the-road intercity service performed as a lease to Greyhound. Our principal operation is interstate between the Northern Kentucky area and Cincinnati and is handled through two terminals where more than 50,000 people per day pass. We employ in regular service approximately 300 operators who make use of 135 motor buses, 31 trolley coaches and 10 street cars in transporting about 100,000 people per day. Our limousine service, operated between the Greater Cincinnati Airport and downtown hotels, employs an additional 21 persons and operates 15 pieces of equipment ranging in size from 7 passenger cars to 21 passenger Flexible Airporters. I make this description in order to qualify the remark that our safety problem, we feel, is unique in its variety for a small company, and that this necessitates a little departure from usual methods in handling those problems.

The management of our company is aggressively interested in safety and accident prevention work and has not stinted, within the bounds of the limitation that we are a small company by industry standards, in providing means for carrying out a safety program. With the Green Line, safety is a first consideration.

Our safety program is built around a safety board which came into being as a result of the feeling on the part of both the employees and the company that safety performance is a matter of concern to both. I like to term our program a cooperative accident prevention effort because of the fact that responsibility is placed on both parties—the union and the company—to reduce accidents.

The birth of this safety board is, I think, an interesting story. Over a period of years the matter of accident costs has entered into all wage contract negotiations with the union. Both parties concluded that this was money poured down the drain and that something should be done about it. After a great deal of discussion, it was decided that the matter would be turned over to a committee composed of both union and management representatives who would make a survey of the situation and recommend a plan of action. The union elected two representatives who fortunately were members of their executive board, and the company appointed two representatives and asked the manager of the claims department to sit in as an advisor.

It was this committee which finally became our safety board. At present, the board consists of, in addition to the aforementioned, the superintendent of equipment and a Dixie Traction representative, for a total of seven members. As presently constituted, the board functions as an independent unit with full latitude to take any action it sees fit, and I might add that we consider partisanship, balance of power, and jockeying for advantage, to be practically non-existent in this organization.



It is the principal function of this board to study and devise accident prevention programs and in this effort all of the information and materials available are placed within its hands. There are, for instance, accident studies made from the A.T.A. designed Keysort cards which were instituted by the company to provide analyses information to the board, and studies of various sorts provided by the claims department and personnel department, the National Safety Council, and The American Transit Association. Some of the accomplishments of the board have been:

Many conferences with traffic authorities of various cities directed toward elimination of accident hazards.

A study of safe bus stop requirements.

Recommendations for use of A.T.A. accident analysis system.

Meetings with employees.

Designed a new accident report form.

In fact, the board has designed the whole safety program and, as a part of that program, recommended the use of National Safety Council services. The board did a great deal of studying on this subject and its conclusion was that there was a very definite need for the type of materials furnished by the Council. We felt that we could not reproduce those materials at any practical cost, and that without these services, our program could not succeed. This phase of the accident prevention program makes use of the following council services in the following manner:

*Safety Posters*—size 17x23 and 8½x11. These posters are placed on bulletin boards in division driver rooms and are changed once each two weeks. Our idea here is to keep in the minds of operators particular problems associated with safety. We quite realize that the operator is the man to make safety conscious and that his performance is the gauge of the program's success.

*The Driver Letter* is written by the Council for distribution to the individual operator and covers some particular topic of safety. At present our letters are distributed by division superintendents to operators in personally addressed envelopes but, we feel that having this item go to the operator's home is more desirable and hope to work this out in the near future.

The *Safe Driver* Magazine is an interesting small booklet and is also distributed in the same manner as the letter.

*Dash Cards* are displayed on the dashboards of all our vehicles and these cards are changed once each week.

The booklet, *For Experts Only*, has also been distributed to all of our operators. The first distribution was made at the general safety meeting in February of this year and tied in with the presentation of Safe Driver Awards. Since that time all new employees are presented with a copy of this booklet as a part of his training material.

The *Safe Driver Award* has been established in the minds of our men as a mark of distinction to be earned by diligent attention to duty and safety, and at the end of June of this year, we are proud to say that 125 of our nearly 300 operators are wearing this badge. Since this award has only been in effect for six months and since our accident grading procedures have been very strict in this time, we consider this a creditable performance.

Aside from these materials, we obtain from the Council, accident prevention data such as accident rates, accident facts, and answers to particular problems which prove invaluable.

You may be interested in other portions of our program as designed by the safety board. It is this company and the board's opinion that we Americans cannot be forced into anything. We don't believe that operators can be suspended, fined, or penalized into safe operation. A psychology of fear may result in temporary or apparent improvements which we do not believe will last.

We believe that operators must be trained to operate safely and that every effort should be expended in that direction with suspensions and dismissals held as a last resort. We believe that an adequate selection procedure and training program will produce a high percentage of safe operators

and weed out those undesirables incapable of receiving training.

We have instituted at the beginning of this year a new selection and training program along the lines of the A.T.A. recommended procedures.

*Accident Grading*—We feel that the matter of accident responsibility grading is important in determining performances and further, in making operators accident conscious. We use a numerical grading which adapts itself to coding on our analysis cards and is designed to provide some lee-way in degree of responsibility as follows:

1. Operator clearly not at fault.
2. Equipment failure where failure could not be foreseen.
3. Operator exercised ordinary care but could have avoided the accident by extraordinary care.
4. Ordinary care would have prevented the accident.
5. Careless, avoidable accident.
6. Reportable incident.

Accidents graded 3, 4, or 5, are chargeable as preventable both on company records and for purposes of National Safety Council Safe Driver Awards.

The establishment of this grading is done in steps:

1. The division superintendent after an interview with the operator when he hands in his report, recommends a grade.
2. The assistant superintendent of transportation reviews the report and after investigation with supervisors and equipment department, makes his recommendation.
3. Accident performance record is reviewed by personnel department and record attached to report in certain cases.
4. Approved grade is affixed by superintendent of transportation.
5. Operator is notified, by form letter. This, we believe, is a highly important part of the whole scheme since the matter of grade is of primary importance to the operator. (Sample).
6. If the operator upon notification differs with the assigned grading he may appeal to the safety board who will hear his case and make recommendations to the company for change if warranted. This too, we feel, is important and it may interest you to know that of 17 appeal cases heard in six months of this year, nine have resulted in recommendation for change to non-chargeable classification.

You also may be interested in knowing how this grading system has worked out comparatively. In 1947, of a total of 1,227 accidents 289 were charged to operators as preventable. This is 23.5 per cent.

In six months of 1948, of a total of 530 accidents, 188 were charged to operators in the preventable classifications. This is 35.4 per cent. What I am pointing out here is that while we have had fewer accidents a closer inspection has led us to charge more of these accidents as preventable with the desired result that more men are shown their responsibility in accident prevention work.

The safety board also meets once each three months with all new operators employed in the preceding three months' period. These meetings provide an opportunity to get acquainted and describe to these men the purposes and functions of the safety board, to impress upon them the importance of safety. Another type of meeting is one in which the safety board selects accident repeaters and summons them to meet with the board for a discussion of safety practices. At a meeting in July, 18 such operators met with the board and good results have been achieved in all cases. These meetings, held once each six months, do not replace the normal practice of personal conferences and retraining of these men by the company but they aid greatly in impressing them with the solidarity of the effort.

The board operates, wholly without reward, a safety suggestion system where any employee, citizen, or anyone else may make any suggestion in the interest of safety on the property. We have obtained hundreds of suggestions in the twelve months this scheme has been in use and have found many of them to be valuable.

*Results*—Of course, we realize that the proof of any pudding is in the eating and we further realize that six months of experience is not sufficient to base any conclusions upon. We are also aware that not having had an expert safety director, which condition we hope to rectify, we have not been able to apply ourselves as diligently to the problem as necessary, but as a whole we feel that some good results have been obtained.

Comparison of accident figures is not wholly a good thing unless all of the factors which go to make up the figures are considered. However, we can say that compared to the first six months of last year we have had a 14 per cent reduction in traffic accidents, but at the same time, we have had a 19 per cent increase in passenger accidents. The second quarter of the year has shown a more remarkable decrease of 21 per cent in traffic accidents and 9 per cent in passenger accidents. In view of the severe winter and conversion from street cars to gas buses in the early part of the year, we consider the first six months improvement noteworthy.



## Use of Safety Council Materials

By L. D. GALE
Managing Partner, Beloit Bus Co., Beloit, Wis.

During my travels it has been my pleasure and my privilege to visit and observe many transit operations. I have found some to be very good operations while others do not do things as I do. Most of the operations visited have been members of the National Safety Council. During and even after the membership round-up these few unenlightened properties were the object of an intensive personal missionary campaign. What is the status of these operations today? Without a single exception each of them is still in outer darkness. This establishes the super-salesmanship and sterling abilities which qualify me to solve any and all problems of the transit industry.

An amazing and, to me, shocking revelation which I have learned from my travels up and down the country was the number of transit properties who were members of the National Safety Council. That's all—just members. Those properties wherein top management approves a purchase requisition and signs a check with a flourish and secret reluctance for a membership in the Council, then settles back on his swivel chair with a self-satisfied sigh—all of his safety problems settled and out-of-mind for another year. Just like that.

On those same operations take a peek behind the scenes at the maintenance departments. Here, too, top management has granted considerable expenditure to provide equipment and tools. On not one of those operations, however, had top management divulged the formulae which was applied in the safety department. In every case that maintenance equipment and the tools were in constant use. Perhaps the management of those properties await the expansion of the facilities of the National Safety Council—the formation of a sister organization to be called the National Maintenance Council. From this Council all tools and equipment could be purchased and hung on the walls of the garages in spotless and orderly array, for the council membership would, of course, preclude the necessity of ever having to use them.

No, you're darn tootin' it doesn't work that way in your maintenance department nor in mine, and you can just bet your last suspender button that it can't work that way in our safety departments either. Tools which are specifically designed to do a necessary job are just as essential in the safety department for the job of accident prevention as are the tools which are used for overhauling our revenue vehicles. In our industry in which management must be practical to the nth degree, the business of buying tools to do a necessary job and then making no pretense of using those tools just doesn't make sense.

The National Safety Council is a cooperative organization composed of you and me and Joe Doaks. We have pooled our safety problems, our individual accident prevention know-how and our resources. The pooled funds thus made available have made possible a staff of experts in virtually every field of human endeavor, artisans, if you please, who carry on the research, testing and distribution of the tools for accident prevention which we find necessary. The council is ready and able to place in the hands of every member a bag of tools, precision-made, for every job demand, a bag of safety tools which would otherwise be beyond the ability or resources of any individual member to provide. As membership in the National Safety Council increases, so the benefits to each member will increase; first, in the increased resources—the "long green" pouring into the communal pot accelerates research and testing, and will make new and improved tools of accident prevention available, at lower cost, to each of us. Second, it will stock-pile more ideas and know-how, the raw materials from which those tools of ours are machined. I say this at the risk of being branded a reactionary, for it is predicated upon sound economics, and I am old fashioned enough to believe in and have faith in sound economic principles.

The staff of the National Safety Council, the artisans which our pooled resources have hired to forge the necessary tools for our safety work, are doing a magnificent job. In the Transit Section, the Commercial Vehicle Section and every other section. It would be folly indeed to attempt to vie with our good friend Paul Coburn in a detailed description of the bag of tools they have provided for the Transit Section.

All or most of you have at some time, some of us many times, been inspired by his accounts of what could and should be accomplished with the various safety tools which he knows so well. If I were to attempt such a descriptive feat I would probably mention the Council's Safe Driver Award as a potent tool. Perhaps some of you happened to notice how my own little operation integrates the Awards with our own Safety Incentive Plan, which was published in *Transit Topics*. I might point to another too often neglected tool—the Dash Card, and how on my property we have developed added use for this handy gadget—also explained in *Transit Topics* some time ago. I might also mention the poster service as a time-tested tool. I would probably mention the *Driver Letter*, the *Safe Driver* and *Safe Worker* as multi-purpose tools. I would certainly recommend those sterling tools: the National Fleet Safety Contest and the Transit Section Safety Contest. I would point to the Council's Accident Review Board for aiding us in the determination of responsibility for accidents. I would certainly touch on those fine tools for visual education and training offered through films and slides. I might mention in passing the tools provided by the wealth of factual, analytical and statistical data which is furnished. Certainly I would be remiss were I to neglect the bonus tools to be had through the fine associations with each other throughout the year and here at the Congress.

Fully realizing the inadequacy of my inspirational ability I shall, therefor refrain from any mention of each item. Your bag of tools has been provided—use them. If you become proficient in their use and achieve a measure of success in your crusade of safety, share your methods with others, thereby providing additional know-how and new tools for the rest of us. It is by such concerted cooperative action that success in our accident prevention work can and must be achieved.

It ain't the individual
Nor the army as a whole,
But the everlasting teamwork
Of every bloomin' soul

Each one of us feels that his puny efforts are akin to an attempt to stem the mighty Mississippi with a twelve inch plank. It takes a lot of them and a lot of know-how to join them, but that great river can be dammed, and with twelve inch planks.

It is unthinkable that any of us could pull an ostrich act and stick our heads in the sand when we are faced, daily, with our own accident prevention problems and the problems of our neighbors and our industry. It is unthinkable that any of us could scorn to use any and every means at our command—every tool in the bag—to curb the needless economic waste resulting from the horrifying accident toll being taken every day on our streets and highways.



# Need for Transit Operating Safety Program

By E. D. MERRILL
President, Capital Transit Company, Washington, D. C.

Anyone who has been connected with transit operations in a large city over any considerable number of years, needs no reminder of the unnecessary human suffering which results from accidents. We have all had friends involved in accidents with transit vehicles and the personal suffering and difficulty which arises as a result of such experience is thus brought home to us vividly and becomes a sharp stimulus toward the promotion of the safety idea; not that we should think more seriously of accidents to our friends than we do of those which occur to people with whom we are not acquainted, but injury to a friend or neighbor does bring a sharp realization of the exposure to accidents.

From the standpoint of the general policy of an operating transit company, the matter of accidents is more than a mere matter of dollars and cents. The reputation of the company for safe operation is a very valuable asset in all of the dealings which the management must have with public authorities and with various citizens' organizations. It is, I believe, helpful toward increasing travel on the lines of the company.

When you add up all of the individuals who are concerned with an accident, and I am speaking now of the individuals outside of the company's organization, you will see that a tremendous number are involved. Payment of damages would not erase the pain nor the recollection of humiliation or embarrassment resulting from an accident, and even if no payment is made because the company is not at fault, the person who suffers will feel aggrieved toward the company whose vehicles may have been involved in the accident. In addition, there are witnesses, the family and friends who know of the circumstances and who spread the discussion of such things, and in case of trial there are lawyers and jurymen and judges who are reminded of the hazard connected with public transportation. All of these influences build up a background of public opinion which is good if the safety record is good and if accidents are handled in the best way, and which is bad if the reverse is true.

I believe that most people who have analyzed accidents must agree that accidents are preventable. A cause can be found—lack of intelligence or of proper precaution, or lack of attention or some other circumstance defined broadly by the word "negligence."

It may be that we talk too much about *prevention* of accidents, whereas we should think of the proposition in terms of *safety* as an ideal toward which we should develop an active and constructive program. This will perhaps assist in placing more emphasis on safe operating conditions along the routes over which we operate and in the shops, garages and carhouses, where maintenance work is done. We cannot, of course, expect to make the condition foolproof, and there rests on the operator of a vehicle on the road, or machine in the shop, an important degree of responsibility for safety precautions and safe habits even though we may furnish him with the safest surrounding conditions we can devise.

Those who have to do with the general policy of the company and the disciplinary processes have their share of the burden of responsibility. Negligence in applying proper discipline or providing the safest operating conditions is just as culpable as negligence on the part of the individual actually involved in the accident.

The costs arising from failure to accomplish the best results in the direction of safety are very serious, particularly when all costs are rising and traffic declining. Any item of operating expense which may absorb from 3 to 10 per cent of the gross revenue of an operation is of grave importance and every precaution is naturally taken to reduce the amount of such at item.

Just as a sample of the kind of expenditure involved, I note in the American Transit Association's report for the year 1947 on the operations in cities having a population of 500,000 to 1,000,000, a group of four motor bus companies spending for injuries

and damages two thirds as much as is spent for fuel for revenue vehicles, and a group of four electric railway operating companies who spent for injuries and damages 86 per cent as much as they spent for electric power.

Considering the investment we have made at some times in the past for power-saving devices in the hope of saving 10 per cent of the power, I sometimes wonder whether we have given sufficient thought and been willing to spend the necessary funds to accomplish all that can be done in the direction of safety. A typical company may spend on account of accidents several times what is spent for salaries and expenses of general officers and in some cases a great deal more than is spent for all of the officers and general office clerks.

Admitting then that accidents *ought* to be *reduced and that they can* be, *because they* involve some form of negligence on somebody's part, it would seem that all concerned would be constantly on the lookout for ways to improve the record, and we might wonder why a *special program* need be considered. Isn't everybody fully aware of the problem and awake to all of the possibilities?

We have two kinds of accidents, namely; the accidents which occur on the road by reason of our operations, and the accidents which occur in our shops or in other operating units and which involve our own people. Both kinds have the same human interest *and the same reasons for trying to eliminate* them. A different sort of program may be needed to get the best results in the two different fields. I understand there are others here who may discuss the details of safety programs but I would like to call attention to some of the elements in the problem, some of the reasons why, from the viewpoint of the general management of the company, a "*program*" is a good thing.

All the various departments of the company are involved and each must do its part if results are to be accomplished. The employment department has a vital and critical part in the selection of new men. Failure here is difficult to overcome in other departments. The transportation department has a vital part in the training, retraining and the "preventive discipline" which is really a constant retraining process. This matter of preventive discipline I regard as extremely helpful in eliminating accidents while conserving the valuable asset arising from the retention of experienced employees. The maintenance department must keep the vehicles safe for operation and must train and retrain employees in the *establishment of* safe habits in all the mechanical operations of the company.

The claim department, which is called in to get us out of trouble when we fail in our safety program, and which should be constantly needling us to strengthen our safety efforts, also has a valuable contribution to make. The engineering department studies the physical layout of shops, garages and carhouses and the conditions along the various routes where vehicles are operated. The accounting department shows us the good or bad results of our efforts in cold, but convincing, dollar figures and comparative statistics. *With such a variety of* responsibility, there may be a tendency to blame the other fellow for accidents and this points to the need for coordination of all of the safety work, to be sure that all are conscious of their responsibilities and work together to the best advantage to accomplish the common objective.

The habit of safe operation by trainmen, bus operators and shopmen should be established in the training period but constant reminder is necessary to keep the safe habits working to the fullest degree. We are all human and very few are above the need of a stimulus and repeated reminder of the *need for safety precautions and all of us* can benefit by utilizing the new ideas that come, either in our own groups or from those outside of it.

I believe that these general considerations show plainly the need for a safety "program," but I believe further that each company will have its own method of going about that program. There are strong arguments for placing responsibility on a single individual known as the safety engineer, or by some other title, who will devote his entire time to investigating accidents and proposing means of carrying on our operations more safely. There are other arguments, very strong ones to *my* mind, for placing the emphasis upon the responsibility of each department, each foreman and supervisor, for carrying on the work in his small field with the greatest degree of safety.



I think nothing should be done to detract from the direct responsibility of every department head and supervisory officer and member of the staff for giving active and very constant attention to measures looking toward safety.

Much will depend upon *individual personalities* available in any organization to carry on the work. It may be that the general manager has safety uppermost in his mind and is constantly hammering away at it. The individual most concerned in dealing with accidents is the head of the claim department. Perhaps he is the most conscious of the need and has the special endowments of tact and persistence to get things done. He is constantly reminded of the cost and the serious effects on public opinion which grow out of accidents. He may be the one in the best position to remind all departments of their responsibilities and keep them alive to the problem.

Whoever is responsible for the carrying out of *the safety program and whatever* type of organization may be used to accomplish the purpose, I am sure that a safety program carefully worked out and diligently pursued will produce beneficial results not only in the matter of cost reduction but in the field of community relations and the development of friendly support from all elements in the city, and will, therefore, be one of the most valuable and important activities carried on by the company.

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# Organizing for Operating Safety

By EARL PLETTNER

Assistant Superintendent of Transportation, Milwaukee Electric Railway & Transport Co.

My connection with the Milwaukee Electric Railway and Transport Co. has been that of an operating man. For the last 20 years I have been in charge of traffic studies and the planning of schedules for the system. My problem has been to secure efficient and economical performance while maintaining the essential elements that permit safe operation. However, no operating man can overlook the angle of safety because accident costs are pure waste and certainly do not promote economy or efficiency.

We are rather proud of our company's safety record in recent years. In 1943, 1944, 1945 and 1946 we won honorable mention or special merit awards in the American Transit Association's safety contests. Our accident costs have been low, ranging between 2 and 3 per cent of revenues even under conditions of present high costs.

During 1947 and the first half of 1948 we selected and trained 428 new operators for replacements, service expansions and increased off days and vacations. In spite of this influx of new men (23 per cent of our present force) we have maintained low frequency and severity accident rates.

Our safety organization includes every man in the executive, supervisory and training divisions of the company, but we have no separate extensive safety division as such. We have no rule book and give the new operators no printed material of any kind. This I believe to be rather unusual and the reasons for it will be discussed later.

I propose to point out the elements that we consider essential in a program of organizing for operating safety.

*Essentials of Sound Program for Operating Safety*—In enumerating these essentials I am going to describe chiefly our own organization because we believe it to be sound and to produce most of the desired results. We work on the assumption that safety cannot be instilled by means of speeches, lectures, contests, meetings, dinners or prizes. The natural reaction to these devices is that "they are fine for the other fellow, but I don't need that sort of stuff."

When accident producing conditions arise all of a sudden, the only thing which can prevent or minimize the catastrophe are the reactions and habits formed previously by the persons involved. No one has time to

get out a rule or instruction book to see what he should do, or to think back about the last lecture on the subject. His immediate reactions from previously formed habits determine whether or not there will be an accident.

It is on these reactions and operating habits that we concentrate in our organizing for operating safety. Before getting into details, however, we should like to point out the general type of organization on our property. We have—

1. A central safety committee in the company.
2. A representative on the City of Milwaukee Safety Commission.
3. A careful selection system.
4. A thorough departmental training and follow-up system.
5. Careful investigation and follow-up of accidents to prevent repetition.
6. Careful investigation and follow-up of equipment failures.
7. Careful investigation and follow-up of schedule troubles reported by operators.
8. An important place for safety in departmental meetings and foremen's conferences.

We should like to comment briefly on some of these and in more detail on others:

*The Central Safety Committee*—This committee meets once a month under the direction of the company's vice-president. It consists of the heads and principal representatives of the various company departments. Accident trends and costs are discussed. Those pertaining to certain types of failures are pointed out and remedial measures suggested. Important individual cases are discussed. General information and matters of interest are also brought up for discussion.

This is the co-ordinating unit for company activity. The interests of management are passed on to department heads. The viewpoint of the claim and personnel departments are presented to operating departments. Departmental responsibilities are allocated.

We consider this committee to be very essential as an informational, co-ordinating and directional agency.

*The City Safety Commission*—Our superintendent of transportation represents the company on the City Commission.

This is a very important connection since it co-ordinates the interests of the company and city on common problems. Questions of turns, safety islands, stops, parking, etc. are all involved in operating safety and the common interests of both parties can be worked out on the spot. Recommendations of both safety groups can be passed back and forth.

The Milwaukee Safety Commission Traffic Group has been exceedingly co-operative on matters involving the safe operation of company service.

*Operators' Selection System*—Problems of safety are simplified when the misfits are weeded out before they have a chance to have accidents. We have been doing this for over 25 years. During the past few years the American Transit Association has been actively engaged in developing a selection procedure usable by members of the industry. Our pioneer equipment and methods have largely been replaced by these later developments.

The proper selection system is essential in an organization planned for operating safety. Men who pass these tests realize that this is an important job even before they get it and that proper reactions and habits are essential.

*Departmental Training and Follow-up System*—Now we come to the heart of the whole safety organization. The men who work with the men who may have the accidents are the ones who can make or break the accident record.

I have previously stated that our operators get no rule or instruction books. Our training and instruction is of the personal contact variety with constant repetition and drilling on the items which lead to safe operation, namely alertness, anticipation of possible trouble and the proper reactions to those conditions which can cause accidents.

You probably all know that the first three days of training on our property are put in on our private training track where the fundamentals of proper operation are taught under conditions free of traffic interference.

Training is continued on the road for another two weeks under the constant supervision of the same platform instructor who accompanies the student from line to line and constantly directs the formation of safe operating habits.



After the road training another day at the Training Building for check-up and final instruction starts the new student out on his own but not without constant follow-up instruction. The regular follow-up instructor then takes over and follows the new student daily until he is certain that right habits have been firmly established, then at longer intervals until he feels it safe to get down to the regular monthly routine. We have eleven follow-up instructors.

Each one of the 428 operators hired in 1947 and the first six months of 1948 was trained in the above manners for street car operation, gas bus operation and trackless trolley operation and were qualified for all three services in the relatively short period of approximately six weeks. These men switch from line to line and from bus to car, to trackless trolley daily. They may even operate all three on the same day. This complicates safety training and is really a severe test of a training sytsem.

It is this constant drilling and repetition of fundamentals that we believe lays the foundation for most of our success in the reduction of accidents. Constant alertness and anticipation of possible trouble and the formation of quick habitual responses is the secret.

We now have about 70 operators on our property who have qualified as platform instructors and receive men for road training. These platform instructors are carefully selected on the basis of their operating and accident records and ability to teach. Men interested in the job make application for it and after selection are on six months probation before they are finally accepted and given a platform instructor's badge.

While the new operator is under the direction of the platform instructor the regular follow-up instructor assigned to that station occasionally rides with the new man to check up on the instructional procedure and progress of instruction.

If the platform instructor or follow-up instructor at any time feels that the student cannot make the grade, he is released from the service. This is a further screening after the regular selection procedure.

*Investigation and Follow-up of Accidents*—Accidents are bound to occur (even in Milwaukee) and when they do, steps must be taken to determine the responsibility and prevent a recurrence if possible.

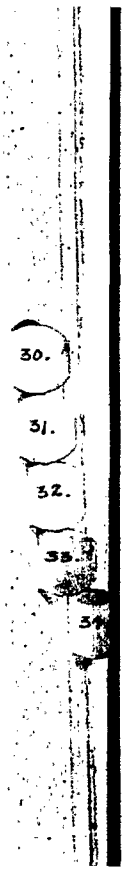
Every accident is first investigated by the division superintendent, who determines the responsibility as well as he can. The division superintendent's report covering the investigation and placing of responsibility of the accident is sent to the claim department. The claim agent looking at the matter from the legal viewpoint and possibly having interviewed witnesses may suggest changes in the findings of the division superintendent.

The head of the training division then receives the copy and enters the accident information on each man's record. The minute he feels further instruction or remedial steps are necessary, special attention is given and plenty of it.

This special attention may take the form of follow-up by the platform instructor (who gets a copy of each chargeable accident). It may take the form of a call to the training division for special interview and check up by the superintendent of training, or it may take the form of a small class assembled at the station of two or three operators who are called together by the superintendent of training for the purpose of going over their records. These meetings get right down to details, responsibilities and suggestions for changes. No one can say "that sort of stuff is all right for the other fellow but I don't need it." Our experience with these special case treatments is that we have no further trouble with them—at least for several years. If we do, more drastic action may be necessary.

This close follow-up of accidents by the training division has nipped many a wrong tendency in the bud and put many a man back on the straight and narrow path of safe operation.

*Investigation and Follow-up of Equipment Failures*—Every accident which the operator claims to be a result of equipment failure is carefully investigated by the rolling stock department. If the equipment is at fault it is corrected and not only on that particular vehicle but all vehicles where



a similar failure might cause a similar accident.

I would like to mention a few of the things that have been done on our property as a result of accidents from equipment failures:

1. To reduce treadle door accidents practically all vehicles have been equipped with what we call the O'Neill, pin-type, door-brake interlock. This was developed on our own property and carries a positive brake interlock when the rear door is open. To reduce falling accidents from rough stops there has been incorporated with the interlock feature a reduced brake pressure setting of about 40 per cent of maximum as a holding brake which permits the operator to make a smooth stop while setting the door handle to opening position.
2. As a result of accidents due to slow application of air on certain types of street cars, air piping was entirely changed to remedy this condition.
3. As a result of a sun glare accident all buses and trackless trolleys are being equipped with Polaroid visors.
4. As a result of several accidents due to freezing of control rods—all such rods on our buses and trackless trolleys are now enclosed.
5. As a result of several arm accidents, through open window, practically all of our buses and trackless trolleys now have stationary bottom window sash.
6. As a result of several accidents where cotter keys were omitted, inspectors must now sign for all cotter key inspections.
7. As a result of an accident due to a failure of air pressure, extensive experimentation is now being made with low pressure indicators.

The above sort of changes are usually not publicized but the results have been of incalculable benefit. Interdepartmental co-operation of this sort has been an essential part of our organization for safety. It is getting exceedingly difficult to charge an accident against our rolling stock department because of equipment failure.

*Investigation and Follow-up of Schedule of Complaints*—The operator's schedule determines the pace of his daily work. Many times some repetitive over-load or improper condition of running time may produce a pressure which tends to result in unsafe operation or at least produces an irritation which causes an unsafe attitude.

We have attempted to correct these conditions by the use of a report form for regular operators. This form is used to report cases of repetitive over-loading, running time pressure or improper operation of fellow operators causing excessive headways. Each report is carefully investigated and the operator making the report receives a personal letter from myself stating the results of our investigation and what has been done or not done to correct the situation.

The above procedure has been of great benefit to us in locating trouble spots and has reduced our schedule complaints from the Union to practically nil. Everyone is happier and we feel that the operators have benefited greatly through the possibility of straightening out the little things in their *daily work that tend to cause irritation and* unsafe operation.

*Safety in Departmental and Foreman's Conferences*—While departmental meetings are generally called to discuss operating problems, safety always holds an important place. Accidents, methods and practices, hazards, etc. are discussed and remedies suggested. In some of the meetings safety is always the first thing up for discussion.

Our company has for many years conducted a foreman's conference program, consisting of monthly conferences for about 8 months of the year. Usually one of these conferences is devoted to safety, either of an informational or inspirational character.

These two types of procedure have helped keep the importance of safety before the operating supervisory group.

In our organization for operating safety, we have the necessary managerial interest and direction to produce co-operation between departments involved; we have the necessary connection with the city safety organization; we have the necessary careful selection of operating material; we have the necessary continual drilling on safe operating fundamentals; we have the essential close follow-up on accident tendencies; we have essential co-operation between departments. Last but not least we try to remove the trouble causing irritations from the operator's daily work. The whole thing sums up to organization for the things that are really necessary for safe operation.



# Operating Accident Records — Their Collection and Use

By COLIN DOBELL

Transit Safety Supervisor, British Columbia Electric Railway Co., Ltd., Vancouver, B. C., Canada

Every safety man is agreed that there is no single cure for accidents, but there is a good deal of difference of opinion as to which tools are the most important in combatting accidents. Some believe careful selection is the most important item, others stress training, and again others urge detailed statistics as the important thing. The fact is, of course, that all of these things are important and must have their place *in the well-rounded safety programme.* The difficulty is to strike the middle line and develop each phase in its proper proportion and degree.

Records have value—very definite value—if they are used. Proper records permit a safety man to tackle first things first. To this point statistics are a help, but don't let them get to be a phobia or a fetish. Don't get to the point where you are trying to prove a relationship between fat ladies and the claims costs of bruised bottoms. There may be a relationship, but you still have to carry fat ladies. Set up your record system and tailor it to give you most of the information you are apt to require. The systems developed and advocated for use by the American Transit Association, National Safety Council, and other organizations, are all good and can be modified to suit properties of whatever size.

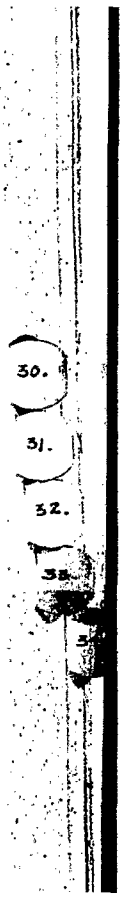
The system to be used should provide enough detail to permit of selective action, whether it be a matter of attending to employees with the highest accident records, to the highest accident locations, or to the highest accident equipment.

With the majority of transit companies it is safe to say that the basic source of information regarding accidents is the operator's original report. Information relating to the time of accident, location, type of equipment, type of accident, and extent of injury or damage to the persons or property involved is usually secured from the employee's accident report. Theoretically, this is as it should be, since no one knows more about the circumstances than the man involved. The big problem is that it is one thing for the operator to know what happened, and another thing to have him provide a detailed description on paper. True, in the case of an inadequate report, a supplementary statement will be obtained by the claims office and probably by the superintendent, but not always is this supplementary information made available to the safety department so that their statistics may be accurate. Moreover, securing additional information by this means often proves an expensive procedure.

The original report should contain complete and accurate information. If the boys who are operating the equipment have not the necessary skill and knowledge to provide a complete and concise report, it is my opinion we should provide assistance.

In Vancouver, we found that most transit operators could not convey a clear picture of the circumstances when an accident occurred. For a long time we either sent a supervisor out to get an additional statement, or had the man come to the office for that purpose. Since so many reports lacked complete information, this got to be a real chore. Not only was the claims office held up until the additional information came through, but having supervisors run around on this work was expensive. Moreover, the employees occasionally got irritated. From their point of view they had reported the occurrence, and if others did not understand the report, it was too bad. That was the situation, and one, I imagine, not peculiar to this one company.

To improve the situation, we adopted the view that an operator's original report is



an important document, that it should contain all basic information regarding the accident or occurrence and that is should be accurate. We then developed new report forms. Two forms are used—one for traffic and miscellaneous accidents, and one for passenger-type accidents. These forms are patterned very closely on the forms developed by Mr. M. A. Kraft of the American Transit Association. We then selected and trained a supervisor to accept and scrutinize all accident reports turned in at our main terminal. This man or his part-time assistant helps each individual prepare his report and makes sure that not only is the detail accurate, so far as can be ascertained at that time, but also that the report is reasonably complete. At all the terminals clerks or dispatchers have also been briefed to do the same job.

We have found this routine very beneficial. Our claims office now has only occasional need to call in a man for additional information on some particular point. They estimate they now need to see 65 per cent fewer men than formerly. Similarly, the operating superintendents can now deal with each accident on the basis of the information contained in the original report. The operators, themselves, seem to appreciate the assistance in making out these reports and, moreover, get a considerable amount of education from the supervisor while discussing the circumstances of the accident being reported. Last, but not least, the information made available to the safety department for statistical purposes is accurate.

This last *is* important. Operating superintendents and supervisors generally tend to discount the significance of accident statistics. Consequently, if safety departments are going to convince management and operating officials of the need for action in any direction, they cannot afford to be in a position of explaining inaccuracies. Records are necessary, in fact vital, to economic safety effort.

On the larger properties a statistical set-up utilizing I.B.M. or Hollerith machines will permit the development of very detailed statistics. In this connection, some of the card sort systems, such as Keysort, can be used for the same purpose and, moreover, are available to the smaller operations which do not have tabulating machines available. In any event, some over-all record of accident frequency is essential. If you know what type of accident is most frequent and costly on your property, you can devote your efforts to that type. If you know which intersections are high on accidents, you can go after them on a selective basis. Last, but not least, when you learn which of your men are most subject to accidents, you can apply your efforts to this problem, too.

This is, I believe, one of the most fruitful fields for selective effort. I am thinking now of 16 men interviewed just over a year ago. These men had high accident records. In checking the record of these men the other day, I found that in the 12 months before the interview they had averaged eight accidents each and a claims cost of $281.00 per man. In the 12 months following the interview these men averaged four accidents per man and an 82 per cent decrease in the amount of responsible accidents and had occasioned only $52.00 of claims costs per man over that period. All that was done in these cases was to have a detailed review with the individual of *all* his accidents, as indicated on the record card, so that *tendencies* and *patterns could* be pointed out. I mention this subject of dealing with high accident men because it is important. On almost every transit property a relatively small group of men account for a disproportionate number of accidents. Many of the men in this category can be made valuable employees, if corrective action can be undertaken.

Corrective action, however, cannot consist of warnings, threats of discipline, or the imposition of discipline. The only kind of corrective action we have found to be of real value consists of carefully reviewing the employee's complete accident history, discussing with him the possible contributing factors and pointing out such faulty habits of operation as can be shown to have contributed to the overall picture. I stress this because, obviously, a detailed review of the man's *accidents is not possible* unless the record is available and unless it is accurate. Similarly, any period of retraining which might be undertaken cannot be made fully effective, unless designed to correct the specific faults indicated by the operator's record.



# What Is My Responsibility for Transit Operating Safety?

**(A Panel Discussion)**

*Discussion Leader:* HALLEK L. MYERS, Safety Counselor, Indianapolis Railways, Inc., Indianapolis, Ind.

*Participants:*

**An Operating Company Official**
W. J. McCARTER, General Manager, Chicago Transit Authority.

**A Superintendent of Transportation**
H. E. PALMER, Superintendent of Transportation, New Orleans Public Service Inc.

**A Supervisor-Instructor**
RICHARD D. HEALY, Division of Operating Training, Transportation Department, Capital Transit Co., Washington, D. C.

**A Transit Vehicle Operator**
JAMES COLE, Operator, Indianapolis Railways, Inc., Indianapolis, Ind.

DISCUSSION LEADER MYERS: Responsibility has two commonly used meanings, one of which naturally follows the other. *Its first meaning is obligation or* duty. The second meaning is blame—as in a responsible accident or responsibility for failure.

In the transit industry, it seems that we use it *oftener* in its second meaning, and we have more triple plays on it in a week than all the baseball teams in history. The passenger says the company is responsible for his accident. The company says the operator *is* responsible. The operator says the blankety blank equipment is responsible. Actually, all of them are like the two farmers some years ago discussing the pitiful plight of agriculture during the last depression. The first one placed all the blame on the administration, and the other said, "Well, Hank, you can't blame me for that. I ain't voted for fourteen years."

Let us think of responsibility in the first meaning—as obligation or duty. *Responsibility* connotes authority. The two go hand in hand. A better understanding of that simple fact would help us gain ground. We have today too many persons in responsible positions making lateral passes to the safety man. No ground is gained on lateral passes. To gain you must carry the ball—forward.

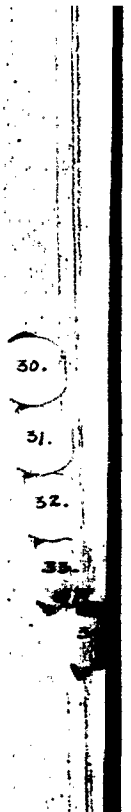
Our panel is composed of responsible persons only. The first speaker is Mr. Walter J. McCarter, general manager, Chicago Transit Authority.

**An Operating Company Official**

MR. McCARTER: I suppose a general manager's thoughts of his responsibility toward safety depend on his background, on his service with his operation, and maybe on the manner in which he arrived at the general manager's job in that operation. I came up through the ranks of safety activity, so my attitude was well known toward accident prevention. In Chicago, by circumstances, I came in from the outside to the general manager's job. Because of that—except that my reputation accompanied me—the people in Chicago didn't know the attitude of the general manager toward accident prevention.

At the outset I tried to get that situation straight. I have just accepted and started a program whereby I am to give forty talks to different groups of employees. You may say that is taking a lot of time for the general manager, but I feel that the employees all have a right to know what the general manager thinks about his responsibility and their responsibility, for accident prevention.

Of course, I think that accident prevention is just good operation, and therefore if you are talking accident prevention from a general manager's standpoint you are talking good operation. I point out, as I go around and talk to the groups of employees in Chicago, what my job is in relation to that program, and what I think their job is. A man's attitude can't be right unless he *knows that everybody else's attitude is right.* His disposition can't be right unless he thinks that the people who are working with him, right up to the general manager, have the same feeling about his job as he has.



It is very simple to justify, in my opinion, spending time on accident prevention. As Mr. Merrill pointed out, the cost of accidents run from 3 to 10 per cent of the gross. In Chicago it is a little more than 5 per cent of the gross. That means we are spending over $5,000,000 a year for accidents. When you are talking about $5,000,000 a year you know it is worth doing something about!

In talking to operators I can go back to the time when I acted as an instructor under Bill Hackbarth, and one of my jobs was to ride with accident prone motormen to try to find out what caused them to be accident prone.

As I rode behind these accident prone motormen, I was very much surprised to find that most of them seemed to be excellent motormen. They made miraculous stops. They would get in a difficult situation, but they were very quick to throw off the power, drop sand at the same time, and just miss a bad accident. You would say, "My, that was a good motorman. He did a swell job." I wasn't finding out what was wrong with these fellows because they were doing what I thought at the time was an excellent job.

So I decided then that I would see what the difference was between those fellows and the men who had no accidents. I started riding behind those people who had no accidents. They didn't impress me at all as being these super-motormen. As a matter of fact, nothing seemed to happen in front of them whereby they could demonstrate the fact that they were quick, that they were super-human in their speed of reaction, and so forth.

After studying that situation over I came to the conclusion that the men who didn't have accidents were so much on the job, were so conscious of everything around them, that they always had things under control. They didn't get into those situations which required super speed and super action on their part. In other words, a good operator doesn't get into situations where he has to think about emergency action.

Now, I am taking my time as general manager to go around and make that simple little statement about accident prevention to our people. I am trying to create an attitude about our job which I think should permeate down from the top to bottom. Sometimes things like that will travel ahead of you. I hadn't been general manager in Chicago more than two months until I found that in the transportation department they assigned two of their best men to the accident prevention division. I suspect that was due to the fact that here was a new general manager, and one of the things he was vitally interested in was accident prevention, so they wanted to begin to concentrate on it.

Recognizing the fact that good operation is accident prevention, all of the techniques that go with accident prevention, all of the investigations, selection, contests, or any of the other things that you do, are things that must be correlated with doing a good job. I don't care whether that is done through extreme concentration on accident prevention, or extreme concentration on training, or extreme concentration on supervision, or in what approach we make or what emphasis we make on that subject—accident prevention is just as good an approach to operation as any other, because you have to do all of the other things in an accident prevention program.

As general manager I am not dictating to our organization as to how that approach should be made, but I think I am making it clear that this general manager is all out for everything that can be done to prevent accidents.

**A Superintendent of Transportation**

MR. H. E. PALMER: I was very gratified to hear people like Mr. McCarter, Mr. Merrill and other members of top management express their views in this matter of safety. I know exactly how to appreciate general managers and presidents, men of their caliber because I am fortunate enough to be associated and work under such top management. If it were not for that attitude on the part of the president and general manager of our company, we certainly would not enjoy the privilege of coming up here to receive a very nice safety plaque awarded by the National Safety Council today.

If I were to accomplish what I would like to do as superintendent of transportation, I would surround myself with the very finest personnel I could, and then my responsibility would be over because, after all, the superintendent does not win anything. He is very fortunate if he can hold together an organization sufficiently to have it win something.

In thinking of what I might say in a very brief period, I wonder what single responsibility I might talk about. Remembering that we have been told that a great majority of failures are man failures, the subject is automatically reduced to that, which is not very much of a reduction, inasmuch as we are told that man failure is responsible for approximately 85 to 88 per cent of all accidents. You know what I am talking about, you experts, but I am firmly of the opinion that in spite of what our titles are, whether we are general managers, presidents, superintendents, agent superintendents, supervisors, or what have you, we are all personnel people. Because of that one factor, that 85 or 88 per cent of failures are man failures, we have to deal with the men.

Now, who are they? They are human beings, just exactly like you and me. They are not faultless. They make errors, but I wonder every time I start criticizing an operator for an error he makes, whether I don't make a lot more than he does.

I think that seeing that discipline is properly administered on the job is the superintendent of transportation's responsibility. The general manager doesn't have time to go into that detail. As a matter of fact, the superintendent can't go into it all the time, but I think it is one of his first responsibilities. And, as somebody was able to point out this morning, discipline isn't meting out punishment. I don't like the idea of the definition if you want to construe it as being such. I believe that we in the transportation business have learned an important lesson, and that is to deal with one another as human beings. The newest bus operator should be treated with the same consideration that you treat or show the president of your company. He is entitled to it. He needs your help more than your superior. I believe that a form of accident prevention is dealing with one another in a humane manner.

It is important to coordinate the activities of the operating department with the other important departments, or those that are essential to good operation and safe operation, such as the medical department.

I think one of the responsibilities of the superintendent we are talking about, is to realize that the heads of these departments are not necessarily operating people. They may not deal directly with safety. They may not deal as much in personnel work as the men in charge of the large group. But it is very important that the superintendent sees that they understand the problem of the operator—the boy who is down in the Chicago loop, fighting to get through traffic—and I don't see how they do it. I don't envy him that job.

When the maintenance men realize that sound brakes and the various mechanical aspects are all important in this business of safety, you are going to help the safety record. And whose job is it? It is the superintendent's job to help him, because he is more or less the coordinating man.

After we have the poor devil out in the firing line, there comes a time when the superintendent has to say "no." He has to say "no" to the union committee when it comes over to get an accident removed from a man's record. I don't know what your system may be of handling accidents and classifying them. In my case it comes back to the superintendent quite frequently.

I believe it is all important to have good sensible, simple rules. I think it is necessary sometimes to charge a good safe man with a chargeable accident. I don't think any man is so perfect that he can go on month in and month out, year in and year out, without having one. He may go a long time but that element of failure is there. I don't care how careful you are you can't be perfect all the time. Naturally, he has to have it on his record, and he will come to you. That is where I think the door has to be left open to him, and a selling job done. This business of saying "no" is hard sometimes. You can say "no" but you can do it in a way not to offend too many people.

I hope that accidents are reduced all over this country. If there is anything that needs attention it is a great reduction in accidents. I am not holding my company up as a shining example. There isn't any company that needs to improve any more than my company needs to, because one accident is one too many, and we certainly have a long way to go to minimize or reduce ours to a minimum. This business of saving lives, and reducing injury and damage is very important. I shall do my very best as superintendent of transportation to support my boys whenever possible. I will say "no" occasionally but as long as they will keep

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that accident trend down, I am not averse to saying "yes."

### A Supervisor-Instructor

MR. RICHARD D. HEALEY: Responsibility for transit safety lies primarily with the operator and with the instructor who has trained that operator. The operator's physical and mental qualifications are determined by the employment office, but it is my responsibility as an instructor to develop a safe operator out of every man employed if possible.

I must be able to gain and hold the confidence of every new man. I must take a personal interest in each employee and demonstrate this interest by my eagerness to help him in every way that I can. I must get him started on the right foot and make him a credit to the company—for to the general public the operator *is* the company.

One of the first steps in transit operating training is to prepare a new man for his job. He must be sold transit service and the important part he will play in that service. I must give him a reputation to live up to. I must arouse in him an eagerness to want this job, because it is my responsibility to make him the best operator on the street.

I must show him the benefits he will receive from being a safe operator as well as the effects a good record will have on his progress with the company. If this personal appeal will not convince him of the need for safety, I can point out to him that the next life lost might be his own.

The fundamentals of driving must play a very important role in the training of all new operators. The new man must realize from the start that there is more to his new job than just navigating a transit vehicle on the street. An operator may drive in such a manner that his operation is technically correct, his movements in traffic are strictly legal, and yet pay little attention to the safety and comfort of his passengers or the other users of the street. Such an operator cannot be considered a safe operator.

The accident frequency of any large city will show us that the average driver is at best a poor driver. This might be due to many things, including his lack of experience or training. Who does teach the average man how to drive? Dual control autos and driving schools are relatively new. How did you first learn to drive? Was it the best way? Did you know anything about the mechanics of the vehicle at the time you learned to drive?

Before a new operator can operate a transit vehicle safely and correctly I must show him how to make a complete inspection of his vehicle. He must know the purpose and use of every operating device and switch. He must know how to inspect a vehicle as well as how to test each safety device with which the vehicle is equipped.

It is my responsibility to show the new man that the simple act of starting and stopping becomes very complex when he gets into a transit vehicle due to the size of his vehicle and to the fact that the people he is transporting may be standing or walking, and any sudden movement caused by the operator might cause such passengers to lose their balance. This is just one of the many problems that the new operator must understand as he begins his work of learning how to operate a transit vehicle. Once he realizes that he is ready to begin his work of learning how to operate. The new operator *must* first see the need of making these movements skillfully. Then he must practice them under close supervision—practice them until he can make those movements habitually and unconsciously. This is just the foundation of the establishment of habits that will make him a professional operator.

Once the operator has developed the necessary, let us say, "mechanical" habits, those necessary to move the vehicle and to stop it, and so forth, he is ready to start developing the habits required to make him a professional operator. This means that he not only knows his vehicle and the routes, but that he also has the proper consideration for the other users of the street. He must be constantly watching the other drivers or pedestrians so that he will be able to anticipate their actions, remembering that he cannot expect them to always do the right thing.

It is a duty of the transit operator to compensate for the mistakes that other people make, "he must be good enough to avoid an accident that others cause." It is my responsibility to show the new operator just what he might do to avoid these accidents. I must see that he is taken over the streets and shown the conditions as they exist. He must be taught the danger points along his route and made aware of the dangerous physical characteristics of the streets. It is my responsibility to make sure that he knows how to compensate for these potential hazards.

I must instill in him the knowledge of how to operate his vehicle in such a manner that he will not antagonize the other users of the street—he must give others a "break." The transit operator must set the example. He must be the best on the street, and he must show others how to use the streets correctly. He must not take advantage of the size of his vehicle to try to bluff others into giving him what he wants. And it is my responsibility to make sure that the operator understands just those things.

I will not ask the cause of accidents because the answer is too complex, but I would like to ask one question. And since I have a group of experts here it should be a good answer. How much time does the average man make or save by speeding? Experience teaches us that the operator either saves or loses time while his vehicle is standing at passenger stops. This is a surprise to most new operators, and it is my responsibility to make sure that the new operator realizes what *is* to be gained in the saving of both time and temper by the use of courtesy in his passenger relations.

I must show the new operator the folly of becoming upset by the bad manners of other users of the street. What do you do when someone cuts you off in traffic? The transit operator must not allow his attention to become concentrated on how he can "get even." He must not retaliate by operating his vehicle roughly or by being discourteous to his passengers. This is one of the major causes of both inside and outside accidents. When discourtesy is paramount, safety is forgotten.

Now that the new man has reached a definite required level of operating proficiency and has become a qualified operator, it is my responsibility to assist him in solving any transit problems which might arise. I should check his operating performance frequently, encourage his questions, and give him any necessary operational demonstrations. As the new operator progresses, this extra coaching may be gradually diminished until he proves by his every day work that he is able to get along alone to the satisfaction of the company, the public and himself.

Should he at some future time develop short-cuts which are unsafe or inconsiderate it is my responsibility to call them to his attention and to assist him in correcting them, reminding him always of this maxim: "Be Careful—The Life You Save May Be Your Own!"

### A Transit Vehicle Operator

MR. JAMES COLE: My responsibility for transit operating safety is more important to me as an operator than to anyone else. But equally important is the question, "Will I accept my responsibility?"

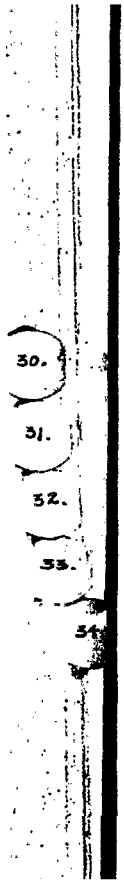
When I look back twenty-five years, which is the time I have been employed by Indianapolis Railways, I see the bus of that time as a very awkward vehicle. It was hard to steer; the pick-up was so slow that an automobile a block away would overtake us before we could pull out from the curb into the line of traffic. And, remember during the last war, the pilots used to use the phrase "Coming in on a wing and a prayer," well, that is just about the way we stopped the buses at that time. We shoved on the brake pedal as hard as we could push and then started praying, hoping the bus would stop some place between the corner and the middle of the block, or at least before we hit somebody.

But when we compare the bus of 1923 to the bus of 1948, we know that the manufacturer of that bus has recognized his responsibility and accepted it. We remember too the only education we received in safety came when we had an accident and were called on the carpet for it, suspended or benched, because in the company's investigation it was found that we could have prevented that accident.

Today all companies—or at least Indianapolis Railways—give adequate instructions to all new drivers and furnish them with a safety manual before they are permitted to drive by themselves. Safety education is continued by holding regular safety meetings where the operator may get together with the officials of the company, to discuss ways and means of preventing accidents.

The creation of a safety department and the endless endeavors of the safety council prove that the transit company has recognized their responsibility and accepted it.





But regardless of all the efforts that are made to make that bus and its operation the safest possible, the operator, who is not alert to the possibility of every accident, can in a very short time spoil the whole picture.

When we see and hear of so many accidents today, involving a needless waste of human lives and materials, we wonder just who is at fault. It isn't the manufacturer. It isn't the officials of the transit company. And I am not willing to accept that the operator is entirely to blame. We, each one of us, have a definite responsibility that goes far beyond the operation of our bus.

This great country of ours is today suffering from a disease known as "automobilitis." It affects a large percentage of drivers, and he is generally a well liked fellow who wouldn't think of hurting anyone until he gets behind the wheel of a car and then, brother, you better *look out!* Notice *too*, particularly on Friday and Saturday evenings, the large number who drive to taverns, spend the evening drinking, stagger out and get in their cars and drive off. Multiply that by the thousands of taverns you have in this country, and you have a fair picture of what the operator has to contend with.

I know that it is very easy to say that the driver of that car was drunk, or that he ran through a red light, or was driving recklessly. But that still doesn't erase that accident, nor does it improve the feelings of our passengers waiting for us farther down the line. We might say why don't the police do something about it. We have laws against drunken driving, against all forms of reckless driving, as well as against the pedestrians crossing the street at other than designated crossings.

First let me say that because we are a public utility, everything concerning transportation and traffic is of interest to us. Local and state governments have been hard to sell on safety. It is only recently that they have begun to teach the public how to drive and how to walk. Because of political reasons, and the large number of traffic violations, their progress will be slow. And until they approach the standard of safety as set by the transit industry, we must, because we are professional drivers, assume at least a part of their responsibility. But before we criticize too severely let us take stock of our own driving.

Do we inspect the bus before we leave the garage or do we just assume that everything will be okay? Do we accelerate our speed evenly? Or do we try to make acrobats out of our passengers? Do we approach bad intersections with our bus under control, or do we trust to luck? Do we stop where it is safe for our passengers to alight, or do we force them to jump over mud puddles and other obstructions? If the light were to change, could we stop without blocking the cross walk or throwing our passengers out of their seats? Do we realize that the passenger pays our salary and is entitled to a safe, comfortable ride? Do we realize that we build the public relations of the company, that by our actions the standing of the company in the community is either good or bad? Do we realize that we were put on this earth to be social creatures and that we should treat others just the same as they would treat us? I am sure that all operators recognize their responsibility and are willing to accept it.

If in the past we have violated safety rules, it wasn't that we didn't care. It was only that we didn't *think*.

DISCUSSION LEADER MYERS: No doubt, you have some questions to ask these *gentlemen*.

MR. HOLT: I would like to get the operator's thoughts concerning the rule book that most of us put up. They are filled up with rules, maybe 100 to 150 pages of rules. Is a large rule book necessary?

MR. COLE: I think that every phase of operation should be included in that rule book. *Now*, I would like to tell you why. A few years ago we had a program that divided our operators into teams. The team that won, or at least, had the least amount of accidents in a month, the other team had to set them up to a dinner. I think for about eight months I was on the team that lost. I didn't have an accident in that *time*, but I was *always* on the *losing* side. There used to be another fellow on the other side who had quite a few—he got his dinner free every month. Well, we used to pan him quite a bit about this, that and the other thing, and why "don't you do this or that," and he would say, "There is nothing in here that says anything like that."

*I think that every phase of operation* should be in that rule book or safety manual, or whatever you wish to call it.

# TRANSIT NEEDS AN Employee Safety Program

By Arthur J. Naquin

**Safety Counselor, New Orleans Public Service Inc. and Immediate Past General Chairman, Transit Section, National Safety Council**

NEED we take time to convince ourselves that there is a need for more employee accident prevention work in our industry? Apparently so, for last year:

1. Our industry again yielded a dubious palm of having the highest job-time accident frequency rate since 1950 when such figures were first compiled.

2. Our industry again had the 39th highest employee accident frequency rate among the 40 major industries in this country.

3. We had the greatest number of reported disabling injuries since the National Safety Council and the American Transit Association have been keeping such records.

4. The annual job-time cost somewhere between $1,750,000 and $2,500,000 for work-man's compensation claims paid, medical costs reported to the Association of Casualty Associations. I believe that it is more nearly $4,000,000 for the actual number of full days lost last year were estimated to be 225,000. At $20.00 per day you can estimate for at least 2½ millions of dollars lost.

To this must be added the cost of time lost due to partial days lost on the day of the accident; the cost of time lost on the days following the injured employee's return to work but on which he must still report to the medical department for treatment; the time lost due to all the 150,000 or more minor injuries which were treated but for which no lost time is reported to the A.T.A. and the National Safety Council; the cost of the 72 fatal and permanent total disabilities which occurred last year ($100,000); the cost of 122 permanent partial disabilities ($250,000); and finally, the cost of all those accidents experienced by transit companies which make no report of them to the A.T.A. nor to the N.S.C.

Remember, too, that this total sum of—say $4,000,000—represents only

the direct costs of personal injuries as our accountants would compile such costs (compensation claims and medical costs). *Professional safety engineers* know that the ratio of indirect or hidden costs to direct costs is somewhere between 2 to 1 and 4 to 1. Combining direct and indirect costs of personal injuries in the transit industry, it is my conservative opinion that the total amount paid out each year because of industrial injuries is about $12,000,000.

This is a staggering sum, and the responsibility for reducing such needless costs is so great and so personal it should electrify everyone in the industry.

Since accidents are NOT bound to happen, there is a crying need for a greatly expanded employee safety program in our industry.

When Roadway or Right-of-Way or Maintenance-of-Way Departments report industrial accident frequency rates as high as 105 and 119 and 134 and 138 and 283 and 348 lost time accidents per 1,000,000 man hours worked, and when such rates can and should be held down to between 15 and 20, there is an overwhelming need for better employee safety programs.

When only 217 American and Canadian transit companies report in 1947 their employee accident figures to A.T.A. out of a total of 1,432 transit companies in the U.S.A. alone, it indicates that there is need on the part of transit managements to have some real appreciation of the size of their employee accident problem.

Perhaps the best proof that there is need for a better national transit employee safety program lies in the results obtained by a small group of 39 transit companies, who entered the *first Transit Section Employee Safety* Contest conducted by the National Safety Council from July 1947 to July 1948.

a. First of all, they consistently lowered their frequency rate month by month from 22.72 in June, 1947 to a cumulative average of 17.63 for the 12 months period.

b. This rate of 17.63 was 33 per cent below the national average of 26.19 for 217 companies.

c. Thirty-two of the 39 companies had rates below the national average.

d. Seven companies *did* not experience a single disabling injury during the entire twelve-month period.

To all of them go my heartfelt thanks for their cooperation and encouragement during my two-year term of office as general chairman of the Council's Transit Section.

Facing the facts now as I see them, we have a long way to go on the problem of reducing employee accidents in the transit industry.

We have first to regain the ground we have lost and have been losing since 1940.

Transit managements ought to be informed that they are letting controllable mishaps go uncontrolled.

Management must be convinced that one of the best ways that we know of for reducing public accidents is through employee education in the prevention of personal injuries, and that an employee safety program will not only pay its way, but will save money which is now needlessly spent at a time when the industry is faced with high operating expense and inadequate revenue.

We must demonstrate to management that a competent program of employee accident prevention will foster good employee relations; that the beneficial effects from such a program will, in return, tend to maintain or improve good public relations.

We have to fight off our industry's lethargy, ignorance and lack of interest in transit employee accidents. The steel industry did it. The communications industry did it. The cement, textile, chemical, rubber, automobile, aircraft and electrical equipment industries did it. They saw the need for effective employee safety programs, and they instituted them. All of them enjoy accident frequency rates of 10 or under.

Must we bow our heads in shame and confess that our industry--Transit does not see the need?

Reprinted from PUBLIC SAFETY, May 1949 5c 5/49

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**Volume 30**
**Transactions**
**1948 National Safety Congress**


GREEN CROSS FOR SAFETY


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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Con- ess. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress' Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE WOOD PRODUCTS SECTION

This volume is a record of the sessions held at the 1948 National Safety Congress by the Wood Products Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Wood Products Section carries on in behalf of its members, and for the benefit of accident prevention work in the wood products industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of the wood products industry. The activities of the Section are under the direction of its Executive Committee, the members of which are listed on pages 10 and 11 of this volume.



## An Engineering Approach to Small Plant Safety

By CHARLES R. ZESKEY, JR.
Chief Engineer, T. H. Mastin & Company, Kansas City, Mo.

Being an engineer, I also have a very great interest in the engineering aspects of safety, and I'm sure you're as familiar as I am with our loud and long public and private wails to the effect that we have such a small stature in the professional field. Frankly, I feel that our stature is deservedly small. That is, if we want to be classed as engineers instead of school teachers or policemen. Suppose we compare our own progress in the past ten years with, say, the progress made in the fields of chemical and architectural engineering. We have nothing to brag about.

Remember now, I haven't said *I* think we should worry, *right now*, about our status as engineers. I'm not at all sure that we should. I think that we should probably be "desai-engineers" for the time being. But, at any rate, there's a lot of boot-strap-pulling-up these days, and I think we are anxious to use, and should use sound engineering principles if we can find a way, and the time, to use them.

I'm going to tell you about a plan we have developed and used from time to time which is applicable, of course, to small woodworking operations, but just as applicable to nearly every type of industrial operation.

I believe, and I hope you agree, that, elementary as it is, it is a true engineering approach to the prevention of industrial injuries.

I'm sure the idea is not new. It's too simple and too workable and too saleable to be new. However, I have not heard of its being used before, and I was most pleasantly shocked about a month ago to find a much more scientific and much more detailed discussion of a very similar procedure published in *Mechanical Engineering* magazine. It is entitled "Accident Prevention Using Operations-Analysis Procedures," written by Mr. John V. Grimaldi. I very luckily had the opportunity to talk with Mr. Grimaldi last month, and I explained that my talk today is not an intentional bit of plagiarism. It turns out that both of us are interested in a workable engineering approach to the prevention of industrial injuries, and neither of us takes too much stock in the theory that only 10 or 15 or 20 per cent of all industrial injuries are preventable by mechanical means—that is to say, by engineering methods.

At any rate, since it will give you a better understanding of the basis of the plan which I'll describe later, I think I should explain that Mr. Grimaldi proposed that a job or a process be first analyzed physically —broken down into its component steps— these steps be listed, the accident potential of each step be determined, and corrective measures be taken on the basis of the analysis.

It is strictly a methods-engineering approach with the emphasis on injury prevention rather than efficiency, but it should not be surprising that he found that, after the proper corrective measures had been taken to eliminate the possible causes of injury, efficiency was also measurably increased. As an engineer, Mr. Grimaldi went beyond the obvious fact that heavy objects falling on toes will cause injuries. In one example, his recommendation was not safety shoes for the employees, but a revised operations method which placed heavy objects where they could not fall on toes.

That this approach takes more time, more imagination and ingenuity, and a better safety engineer than the conventional approach is not to be doubted. Nor is it always possible for all of us to spend the time necessary to do justice to this method. When one is dealing with one or two hundred plants instead of one or two (not forgetting the personalities of the executives, their labor problems, and so on) he may be forgiven for over-simplifying and short-cutting the ideal method, and for developing a reasonably accurate facsimile of his own. He cannot be forgiven, however, if he fails to maintain the questioning attitude which is necessary to the conduct of a true engineering analysis and to the finding of the correct solution to any accident preven-

tion problem. He must constantly ask "Why?"

If it is true that "methods safety analysis" will improve the efficiency of the average operation, the converse is likewise true: increase the efficiency and you decrease the hazards. In small plants it would probably be more accurate to say: decrease the inefficiency and you decrease the hazards.

From the practical standpoint, as will be shown in the following example, it is frequently easier for the perambulating safety engineer to start with production than with accident prevention. Also to be considered is the probability that the small plant owner will turn his good ear to a conversation about increased output and his other ear to talk about safety. He doesn't know what a man-hour is, and cares less; your question about frequency rate may well get you Hornsby's batting average in '24. The small plant owner is interested in the number of kitchen chairs, baseball bats or screwdrivers he can turn out in one day, and how he can increase the number.

With this as the premise, and on the theory that the real solution to many an industrial injury problem lies somewhere in the overworked and vague phrase "efficient production," a small plant can be approached in a manner which will do reasonable justice to the title "engineer"—looking first toward "efficient production" and working toward accident prevention through the back door. Take, as an example, the following case:

This is a "typical" small plant. It regularly employs 16 to 20 men in the production of farm wagon bodies and stock watering tanks. The present owner is the proud founder, manager, maintenance man and trouble shooter. His labor troubles are—on the scale of his plant—multitudinous. He has two elderly craftsmen who have been with him for over 30 years. The rest of his help is week-to-week unskilled labor for the most part.

His injury rate was ridiculous. In a plant which should have, on the average, one lost-time injury a year, he had been having all the way from four to fifteen. His products were good, but they used to be better. His output was dropping, and he was hard put to find a carrier for his compensation insurance. But he was still not too much interested in accident prevention work, as such.

Initially, a two-hour period was spent observing the operations of the wagon body manufacturing department. A chart was then constructed. Arrows were drawn on the plan view showing the flow of work from machine to machine (corresponding to the paths taken by the employees) and a tabulation was kept of the volume of work following each path.

Originally, this was shown in actual numbers of trips, but was reduced to percentages for the purpose of the chart, and the size of the arrows were made roughly proportional to the volume of work flow. In itself, this proved nothing, but there did appear to be a reason for the many bruises and scrapes from handling material. Subsequently, a study of this flow-chart was made, the machinery was rearranged on paper with respect to logical placement and facing, and a diagram was made, using the same machine-to-machine paths as in the first plan.

Aside from the very obvious simplification of the work flow and the elimination of all but one pair of intersecting paths with the resulting temporary confusion and loss of time when two or more employees met, it was shown that the material traveled, and the employees walked *less than 50 per cent as far as in the original plan.* Material handling *time* and material handling *hazards* should be reduced proportionately. This was something the owner could understand. The diagram was self-selling; the shop was rearranged.

It did not follow, of course, that output was immediately increased 50 per cent. It must be kept in mind that this method is an oversimplification of the ideal methods-engineering procedure. It is not the whole story by any means, but it does illustrate the fact that decreased production does not necessarily call for more employees or incentive plans or such stop-gap measures; or that the reduction of materials-handling injuries can invariably be found in leather gloves and safety posters.

To return to the case in question: Production *was* increased enough to convince the owner that subsequent recommendations were worth a fair trial. With the machines rearranged, it was obvious enough that work was flowing more smoothly. Previously, the housekeeping problem had been acute. If a safety engineer had dared suggest the employment of a cleanup man, he would have been tossed out on his ear.

*Why* was the housekeeping bad? The possibilities were many: poor material storage, inadequate waste disposal facilities, poor tool storage, lack of aisle maintenance, makeshift oiling facilities, and so on. Each was a contributing factor. The basic cause was not lack of a cleanup man and no safety *engineer* would make such a recommendation.

Following the replacement of the machinery, it was not too difficult to arrange for better waste-disposal and an improved stock storage area. Taken all together, the improvements (including, finally, even reasonable guarding of the table saw) resulted not only in increased production but in almost complete elimination of injuries in the eighteen months since the original survey was made. That this was entirely due to a half-day's work moving machinery around on paper is not argued. It *started* with an elementary problem in industrial engineering which was investigated and solved by engineering methods and followed up by conventional safety educational means. Nor is it argued here that this one simple case history proves the value of any particular theory.

This example was used, admittedly, because the original shop plan was inefficient even to a casual observer. It was not entirely unique in that respect, however, for there are thousands of comparable small plant layouts throughout the country—in your territory and mine. They are not planned—they just growed. In each of them there is the opportunity for a safety engineer to start with *engineering* and work around to *safety.* The results will be comparable to those described above only to the extent that the safety engineer has the opportunity to use, and then does use, his technical education and training, his imagination and his ingenuity.

If the foregoing is to be used as a guide, it should be considered, at best, only a minimum standard. It has been stressed that it is a simplification of a true engineering procedure, designed specifically for small plants, and it should follow that the engineer can and should elaborate on it as circumstances permit.

If we are interested in being known and recognized as engineers, we'll have to do more than read or write editorials in the *ASSE Newsletter* and *National Safety News.* We'll have to learn—or recall—our engineering principles, and then follow those principles. Our present theories to the contrary notwithstanding, our success will come not with more effective means of education (although education is important today because we've not done our jobs as engineers) but with the elimination of the potential of machines and industrial processes to cause injuries. We should use and develop every educational device at our command, but we must realize that these are only temporary expedients.

Eighty or ninety per cent of all injuries may very well be due to "man-failure"—but we are the men who have failed.



## Management Looks at Safety

By W. T. GREEN
Vice-President, The Mengel Company, Louisville, Ky.

Whoever chose my subject knows the secret of industrial accident prevention, for no management ever looked seriously at or for safety without finding ways to reduce the causes of accidents. By "management" I mean "top management." Interest in safety at the top level, if sincere and positive, transmits itself through plant managers, superintendents, safety supervisors and foremen to all employes. Participation

in a company's safety program by everyone on the payroll is essential to a good safety record.

We have twenty plants scattered through nine eastern and southern states, several of which have sustained no lost-time injuries for many years. Our largest plant, employing more than a thousand people, has twice won the National Council's Distinguished Service to Safety award within the last three years. The first time in 1945—1,505,100 man hours were worked without a lost-time injury and on the second occasion, including several months last year and this, 1,287,800 man hours elapsed with a clear safety record. I am told ours is the only plant in the woodworking industry to have merited this honor, and in September our Flexwood-Flexglass Division was awarded the Distinguished Service to Safety Award for operating 1,378,000 man hours without a lost-time injury.

I have no safety rules to give you and no vast array of statistics, but it may be worthwhile to tell you some of the things we have done during the last two decades to protect our workers from physical injury. In 1928 one of the principal speakers at the Safety Congress said his father was one hundred years old on that day and that during his lifetime practically all accident hazards which now confront us had developed. This statement may be open to question because injuries caused by falling, lifting and handling still occupy an important position on any list and they are common to all periods and places. It is true, however, that modern machinery and methods have brought into being many dangerous operations which can be, and in numerous instances have been, the source of increases in accident frequency and severity.

Our company began operations in 1877 with wood boxes made of purchased lumber as the sole product. About 1900 we were using plywood for many of our boxes, ranking Mengel among the first to employ this superior material industrially, and this change added to the hazards of saws, planers, nailers and such shop equipment, those of felling timber, cutting logs and making veneer and plywood. Just prior to World War I corrugated paper and fibreboard were substituted for plywood in many containers for packing goods of relatively *low weight, so* we added the hazards of corrugating machines, printers, slotters, etc.

Up to this time we did no aggressive safety work, and—though our records were neither complete nor very accurate—we seemed to hold our own pretty well against the mounting complexities in our processes and equipment. However, in the early '20s we entered a new field and became the principal independent supplier of machined wood parts for the composite type passenger car automobile bodies, producing also large quantities of truck body parts.

This entailed the building of additional floor space and facilities, as well as revamping the equipment in several existing plants. A large portion of the machinery added consisted of tenoners, mortisers, boring machines, gainers and shapers. New people were hired in large numbers, who had no training or experience in operating such machines.

Our accident record became terrible; not a week passed without one or more severe injuries. Sometimes it was the loss of a hand or an arm. More than one fatality occurred before we became sufficiently awakened to reverse the trend.

Vertical, high speed hand-operated shapers constituted our worst hazard from the standpoint of severity. Often our customer, the body manufacturer or automobile company, would supply us with forms and fixtures, also with specially ground knives, along with their first order for a particular design or model. Such shop tools were generally crude and many of the knives furnished us were of soft steel with a thin layer of higher quality steel welded to one face to form the cutting edge. All of them had open slots to provide adjustment. Some of the bolts for holding the knives to the 7200 r.p.m. heads were of cold rolled steel, with nuts of varying hardness and strength.

On one occasion the hard steel cutting part of the knife pulled loose from the backing, the bolt or nut failed due to the additional strain imposed, and the operator's lower jaw was almost torn away.

The steps taken to prevent a recurrence were:



1. Make a torsion wrench test of all shaper head bolts and nuts then on hand, destroying all those that would not provide an adequate factor of safety.
2. Refer to a given specification by SAE number when ordering new bolts and nuts.
3. Change to blind slotted, solid high-speed steel knives.
4. Test all new bolts, nuts and knives when received by us before checking them out to our production department.

Numerous serious shaper accidents were due to the use of improperly made forms not designed to hold the parts securely and equipped with clamping devices that were awkward or hard to operate, such as eccentric levers or threaded knobs. Our chief engineer, Mr. H. T. Riggs, at present works manager of the company's two largest plants, undertook the solution of this problem and practically eliminated all remaining shaper accidents by designing and building a new type of form. Attention was paid to five fundamentals, as follows:

1. Bases were made of 3-ply, kiln-dried, laminated hardwood 1¾" thick.
2. Easy-acting toggle clamps of our design made in our shop were substituted for the eccentric type of screw clamps which required considerable effort to use and therefore were often not tightened enough to hold the work in place.
3. Grip surfaces made of steel, machined like a rasp were screwed to the base when the parts were hard to hold or the cut unusually heavy. For simple cuts, sandpaper grips were found to be safe.
4. Properly located comfortable handles were attached so that the operator could handle the form readily with his hands in safe positions with respect to the knives.
5. Metal guards were installed in front of the handles to keep chips from hitting his knuckles—which might tempt him to take hold of the form at some dangerous point. (As a matter of fact, we have, before incorporating the changes enumerated, had experienced shaper operators to take hold of the part to be shaped and cut off one or more fingers before realizing that their hands were bound to move into the head making from fourteen thousand to twenty-eight thousand cuts a minute.)

A double-end tenoner is generally considered a pretty safe machine, but in 1928 a Mengel employee was almost sawn asunder in one, dying instantly. He had been gassed in service during the first World War, disregarded instructions in starting up the feed mechanism and apparently fell backward on the chain, due to fainting. Although this was not likely ever to happen again, we immediately equipped our double-end tenoners with electric stops so that anything traveling along the feed chain thicker than the stock for which the machine was then set up, would shut off the power.

These examples are drawn from our experience twenty years ago. I recall the circumstances with chagrin because it then required injuries due to accidents that actually happened to focus our attention on unsafe conditions. I believe that we now foresee many conditions that may cause accidents and remedy them in advance.

You may wonder how we sustain interest in safety. Of course, we have the best safety director there is—Jack Dunman—most of you know him. With Jack around, nobody has a chance to forget safety; he writes a letter early each month, giving each vice-president and division manager the previous month's record and that of the same month last year, also both years to date.

This report is broken down by departments, and I write each plant or department head in our group, commenting on the report, pointing out perfect performances as well as calling attention to situations that need improving. Safety committees are active; our house organ devotes a lot of attention to safety; foremen's meetings rarely end without discussing accident prevention; good housekeeping is stressed; departmental records are shown on bulletin boards kept up to date; electric and other signs are placed in locations where they can be seen readily; our president, Mr. Alvix A. Voit, who spoke at the 1946 Congress, is on hand and takes part in our special safety rallies and celebrations. A Mengel executive is generally an officer or on the board of the Louisville Safety Council.

I feel that whatever success we have had is based on an everlasting promotion of accident prevention among the rank and file workers and making sure our supervisors and other management men know that the basic reasons for our program are:

1. To reduce human suffering by lessening the severity of injuries caused by accidents.
2. To improve production by avoiding the interruptions to work due to accidents.
3. To reduce costs sustained by employees who lose time on account of injuries occasioned by accidents.
4. To reduce costs to the company occasioned by accidents, whether or not they result in personal injuries.

These four basic reasons for accident prevention bring out the finer points in leadership among our supervisors. Someone has said, "Good Management is of more avail than perfect equipment." If this is true, and we feel that it is, there is no place in industry that presents a better opportunity to show results than the promotion of accident prevention. And, strange to say, safety promotion can generally be based on good common sense, initiative and the acceptance of responsibility, rather than on complicated engineering and elaborate safety regulations.

We feel that management has a moral obligation to safeguard its workers which is greater than its legal responsibility to do so. This attitude encourages cooperation.

Management must—by using visible signs; by having its representatives attend accident prevention committee meetings; by installing mechanical guards; by providing good lighting and other working conditions—prove that it is doing its full share before the workers can be expected to give genuine wholehearted cooperation.

Supervisory cooperation can be had by presenting the safety problem in an intelligent manner and by exacting from the supervisory organization the same degree of attention to accident prevention as is required to quality, methods, production, etc.

Management must supply the field marshalls in this battle for safety and by their own faith and enthusiasm they must win for this worthwhile cause the respect and support it needs and so well deserves. It must be a vital part of the operating department, to which a substantial share of time and thought and effort are devoted.

Do not rely on spasmodic campaigns. Most of us know how these work out. Beginning with a big build-up and a lot of ballyhoo the campaign may do well for a week or a month, but there is sometimes a tendency to fail to count minor lost-time injuries. After the campaign is over there may be a let-down in interest and enthusiasm that proves disastrous in accomplishing lasting improvement.

In our twenty plants, the accident prevention scheme is carried on in exactly the same manner in each plant. On or about the 20th of the month, a safety package or plan of action is sent to the manager of each branch, and it contains all material for use in the next month.

There are posters, charts, safety instruction cards, letters to be signed by the manager and bulletins developed in our Louisville office pertaining to the accident prevention subject for the month.

This campaign idea is not new, but it is probably used by our managers to a greater advantage due to the fact that each one knows in advance what the subject will be and has the ground work already laid for him.

We want to give due credit particularly to the National Safety Council and the Wood Products Section for the materials and help made available to us and our employees. The general information and statistics from this source guide us and continually inspire us to work harder for safety.

An old maxim says there is no excellence without great labor. Surely there is slight chance for safety without great effort. There should be real teamwork participated in by all, with the boss pulling more than his share of the load and everlastingly looking for safety. If this is done consistently and aggressively, no one in the organization can for one moment fail to know where he stands on this most important question.



# Taking Pictures for Use in Wood Industry Safety Program

By HARRY LANGE
Production Manager, Sarra, Inc., Chicago, Ill.

(Mr. Lange showed slides from three films he had made for the Wood Products Section, "Timber," "Sawmill Safety" and "Woodworking Machinery," to illustrate the points in his discussion of how to make photographs for safety.)

Most people accept, without question, the statement that a picture is worth a thousand words, but, like many proverbs, it may be misleading. Actually, a picture, like any other medium of communication, is only as good as the job it does. If it tells your story, if it makes people feel as you want them to feel or act as you want them to act, then it is a good picture, a useful picture, but if it doesn't do these things, it is worthless.

When you start out to make a picture, first plan what you want it to do, then make everything in it serve that plan. Sometimes you will find that your story can't be told in one picture. In that case, make as many as you need. Make them tell the story; that is the only good reason for taking them.

Pose your pictures. It is very unlikely that a snapshot of unrehearsed action will exactly fit your specifications. Of course, posing mustn't look like posing.

Use the people on the job as your subjects. Take them into your confidence. They will enter into the spirit of the job and will make better actors than you can hire. Use their knowledge and experience, too. They know the job more intimately than anyone else and can tell you the little details that make your pictures really "tell the truth."

Light your picture to emphasize the point of your story. People will give the greatest attention to the part of your picture that is most brightly lighted.

Light, also, to give your picture depth and shape and contrast. Almost always you need more than one source of light in order not to produce a flat picture with all the front surfaces evenly illuminated and everything else in the dark.

Select angles that emphasize what you want to tell. There is no inherent value in one angle or another, but if you can make your picture tell a better story by climbing a ladder or lying flat on the floor, it is worth the effort.

Select angles, also, that are pleasing to the eye. Particularly, if you are making several shots to be used in series, vary the angle from one to the next.

Usually you know how your picture is going to be used. When you do, make it the shape that you want. Sometimes we see people try to use a vertical picture in a horizontal slide film frame and the results are not pleasing.

Compose your picture as well as you can when you take it. Then work on the composition some more when you print it. By *skillful cropping*, a *picture* can often be greatly improved.

Use close shots, generally, to tell a story or teach a job. Often, however, it is necessary to accompany the close shot with a long shot showing the location with relation to its surroundings.

*Finally*, remember that film is the cheapest commodity you use. Don't be stingy with it. While your lights are set and your subjects posed, protect yourself by making three or four or more shots. The amateur can afford to shoot once from the hip and hope for the best. The professional knows he isn't that good so he shoots several. One of them is sure to be good.

My final advice is, "Take pictures for safety; take lots of them. They will reward you far in excess of the effort you make to get them." The more pictures you take, the more ways you will find to use them. Further, taking safety pictures on the job is one of the best ways of arousing safety interest. In place after place where we have made safety films management has reported that increased safety awareness was apparent throughout the organization and, in many cases, a tangible decrease in accidents has resulted.

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PRINTED IN U.S.A. 12 1798—449—WHP

**Current Topics in**

# FARM SAFETY

**As presented in the Farm Safety Sessions of the 1948 National Safety Congress**


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Interpretation and Use of Farm Accident Statistics ..... 8

A Safety Program for Farm Women ..... 13

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**Volume 31**
**Transactions**
**1948 National Safety Congress**


NATIONAL SAFETY COUNCIL
Chicago, Illinois


GREEN CROSS FOR SAFETY

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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety leaders throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to key individuals at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE FARM CONFERENCE

This volume is a record of the sessions held at the 1948 National Safety Congress by the Farm Conference. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Conference carries on for the benefit of accident prevention work on the farm. The activities of the Conference are under the direction of the officers of the Conference listed on page 19 of this volume.

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# Safe Farming for the Future

By BON D. GRUSSING
**Advertising & Sales Promotion Manager, Director of Public Relations, Minneapolis-Moline Power Implement Co., Minneapolis, Minn.**

Read your papers. Look at the record of your community, and you'll realize that farm safety is a human problem. It is high time we stopped blaming God for these accidents. There are now enough facts available on this problem practically to eliminate it, if all of us want to do so. But it will take teamwork as well as individual effort to combat these man-caused misfortunes.

To get a long range solution and to appreciate and to understand fully the problem of safety on the farm we must consider many things—particularly man's ability to adjust himself to tempo of progress and more particularly to modern mechanization.

We can be hopeful because man has proved his ability to shake off famine by means of his own inventive genius and to create a new world of hope by establishing the art and the science of agriculture—the world's largest and most basic industry on which all mankind and all other industries are dependent for survival, life and progress.

If a little over 150 years ago, the prophets, Moses and Abraham, had been able to return to earth, they would have been entirely conversant with the working tools, methods, and crops that the American farmers of that day used. We must consider too the fact that during the last 50 years there has been more progress and more mechanization on American farms than during all the ages before. While lifting these tremendous burdens of toil from the tillers of the soil by mechanization, life expectancy of American farmers increased to an extent without parallel in history, and because of modern methods and machines more and more farmers were allowed to leave farming to help create and establish other industries. About a hundred years ago 85 farmers were required to produce enough food for themselves and 15 others. Today 15 farmers with modern machinery produce enough for themselves and 85 more plus over 65 per cent of all the raw materials used by industry. Besides this, farmers are now able to help preserve and even improve the condition of the top six inches of that small tillable portion of the earth's surface on which all life depends!

What have these facts to do with safety on the farm?

1. Mechanization is relatively a new thing—and of growing importance.
   - A. The human equation factors of trial and error, of alertness, carefulness and carelessness must always remain an individual matter. Each person must learn to be careful.
   - B. Some machines and some animals have unpredictable behavior patterns. It is better to take extraordinary precautions rather than to take chances.
   - C. No accident ever happens when expected. It's best to investigate all usual situations before trusting to luck that everything will be all right.
2. Farming today is a highly specialized art and science with many diversifications.
   - A. Each job can be beset with accidents if not properly understood in part or as a whole.
   - B. Training of experienced manpower begins almost at birth and should be continued until retirement.
   - C. Since, in proportion to the total population, fewer persons must now do more and provide more, saving lives and man hours is of national as well of family importance.
3. Farmers now have the wherewithal to enable them to farm with safety and understanding and profit thereby.
   - A. They have learned about machinery and adapted themselves to constant changes. If alert they should know how to be careful with their surroundings, animals, and machinery.
   - B. Most farmers can read and write.
     - a. As late as 1865 20 per cent of Americans on farms over 21 could not read or sign their own name.
     - b. We are now 95 per cent literate. Low cost printing has enabled us to get facts on accident prevention to all before accidents occur.



   - C. Farmers want to learn. They want to live, and they want to continue on the road of progress.
     - a. They are beginning to heed safety and danger signs and signals.
     - b. They are the best read (or can be) on the mechanics of both animals and machinery behavior.
   - D. Most farmers are financially able to take advantage of things that make for safer living and accident prevention.
     - a. Our farmers are now relatively better off than ever before in history.
     - b. Available facts point to continued betterment in this category.
   - E. Mechanization has given farmers more time for leisure and education.
     - a. Accidents because of hurried operation or unconsidered decisions could be eliminated.
     - b. Knowing more about what cause accidents, they now have the time to eliminate these causes.

### What Causes Accidents—How Can They be Prevented?

Carelessness causes most accidents, and the only way to prevent accidents therefore is through *education*. No other people are so well equipped with an enlightened free press, radio and movies plus the mechanical know-how of presentation methods as are we in North America. If all the editors, publishers and writers of our papers, magazines, and house organs and trade publications knew the facts and presented them regularly, we could eliminate almost 100 per cent of the farm accidents. Radio, movies and television can help, too.

On most problems these various means of communications say "give us the facts and we'll present them." In this case the National Safety Council can give us the facts, and I must say the press, radio and commercial movies have done an excellent job. But the surface has only been scratched, particularly by farm papers, and our job of education of our people as to the causes of accidents and how to prevent them must be continued.

About thirty years ago industry awoke to its responsibility in helping prevent accidents. You can get the facts on the progress made from the offices of the National Safety Council. Progress was made through trained leadership and close supervision. Safety on the farm cannot be handled in the same manner. The farmer and his family do the work. There may be a hired man or two. Each day each person does a variety of jobs involving hazards of one kind or another. Animals are handled; ladders and steps are climbed; various more or less complicated machines are handled—often these jobs are done by individuals working alone. For this reason supervision by others is out of the question. Each farm worker must, therefore, learn to be his own safety director. He must learn to know, if he doesn't already, that his own life and the happiness of others is always at stake. All farmers are not fully aware of this responsibility because each year more than 19,000 fatalities occur in rural areas and 1,500,000 rural folks are injured. Many thousands will suffer from permanent personal physical impairment each year. According to the Bureau of Agricultural Economics, U. S. Department of Agriculture, here are some facts to consider:

On the 15,000 farms surveyed by the Department about four times as many farm men and boys between the ages of 14 and 64 suffered injuries from accidents as did farm women and girls. Of the youngsters under 14 who were injured, nearly 65 per cent were boys.

Of the total number of accidents *56 per cent were connected with farm work and only 8 per cent with housework.*

Burns and electric shock were more common among women—52 per cent of these accidents being suffered by women and only 48 per cent by men. But in all other types of accidents men took the lead. Falls injured more farm people than any other kind of accident. Most common were falls on steps and stairs and from vehicles. Here again men suffered the most. Over twice as many injuries from falls were listed for men and boys as for women and girls.

The most dangerous age period for accidents for both men and women on farms is between 25 to 64 years. This age group accounted for nearly 60 per cent of all accidents. The period from 25 to 45 is slightly more dangerous than the later years, the survey findings showed.

### Agriculture and Industry Interdependent

Aside from the personal suffering, sorrow, and hardship caused by these accidents (almost all preventable), you may ask what



business is this of, ours? Well, the farmer and all industry are interdependent! Farm areas take around 40 per cent of all consumer goods, and about 90 per cent of the products produced by the farm machinery industry.

We don't want to lose customers. Industry cannot prosper without a prosperous, properly populated rural area. We know that from a cold blooded, practical standpoint, every accident on the farm reduces potential customer or buying power. Industry must learn to be the good neighbor by helping *train* and educate all *its* dealers and representatives to be teachers of safety.

Industry, having had years of experience in safety work in their factories and plants, should be in an ideal position to assist its rural friends in reducing the terrific toll that accidents are now exacting from their ranks at a time when maximum production is vitally needed.

Manufacturers and distributors of equipment and products for use on the farm can help and are helping to safeguard the farmer and his family by exhausting every possibility of making machinery as free of inherent danger as possible. Having done so a definite effort should be made to educate the user in their safe operation and use.

It is, perhaps, surprising to many that the most dangerous place on the farm is the farm home itself, and the immediate surroundings—the yard and the barnyard. The most frequent type of accident here is that resulting from falls caused by the use of unsafe ladders, substituting chairs and boxes for stepladders, falls down stairways, and even falls caused by scatter rugs and slippery floors. This type of accident on the farm results in more fatalities than any other. Burns are second in importance in producing fatal and non-fatal accidents. Cuts by knives and other sharp instruments are also frequent around the farm home.

*Farm machinery is responsible for a large* percentage of accidents. Modern farming involves the use of a great variety of machines and implements, some of which are of a fairly complicated nature. The farmer is generally pressed for time to get his work done and very often neglects to take certain precautions that are necessary for safety in the operation of these machines. The functional requirements of most farm machines makes it impossible to guard effectively certain potentially dangerous mechanism, and it is, therefore, imperative that the machine is stopped before the operator tries to unclog, adjust, or oil any of these parts.

Safety shields or guards are provided on farm machines, where practical, but these are often moved when making adjustments and repairs and are frequently not replaced when the machine is started. This practice is especially dangerous when the shield is designed for protection over the shaft which transmits the power from the tractor to a *cornpicker or combine harvester*, for instance. The failure to keep this shield in place has resulted in a great many fatal accidents and serious injuries.

Of the farm machines, the tractor is involved in the greatest number of accidents. The reason for this is, perhaps, that there are more than 2,000,000 tractors in use on the nation's farms—a far greater number than any other single kind of major farm machine. The greater percentage of fatal tractor accidents are caused by tractors overturning when driving too close to ditch banks, driving too fast on corners, etc. In many instances, operators are run over by pulled implements after falling off the tractor; also, the operator and bystanders are often hurt when the tractor is accidentally started while in gear. The operation of tractors by children or very old people invites accidents. Refueling with the engine running is a dangerous practice and has *resulted in fatal burns and loss of property* by fire.

The aforementioned hazards in all the departments of farm operation offer a challenge to industry to draw something from its fund of experience to help to find ways and means of reducing the annual toll taken by farm accidents.

The farm machinery industry has accepted this challenge and is making a determined cooperative effort to reduce accidents that occur with farm machines. In 1938, through the medium of the Farm Equipment Institute, representative engineers from the major farm machinery companies were appointed to serve on a safety committee to study means to this end.

Since the committee was formed, it has met at approximately six-week intervals, except for a period during the war. Although the companies which the members represent are aggressive competitors for the farm machinery business, they have worked in perfect harmony. It is also significant that the members of this committee have invariably brought to the committee's attention safety developments of their respective companies and have not attempted to retain the feature for their exclusive use.



### Government and Safety

I have tried to point out that practicing safety on the farm, as all of us know, is a habit acquired and retained by means of constant education; that the only place where information regarding farm safety and the practice of safety is effective is on the farm and then only to the degree that is practiced by all individuals on all farms. At least 9 out of 10 accidents are caused by carelessness! You can't legislate or order carelessness off the scene of the American farm. It takes education and cooperation and real team work by educators, industry, farmers and the several safety commissioners of the several states.

Government safety employees should make it a point to confer with our engineers and safety men if they're truly interested in protecting the lives and well being of their fellow farm citizens. They can expect the utmost in *practical* cooperation for the good of all. Some extreme safety measures are not taken by industry because of the excessive and prohibitive costs involved to the customer. Other things such as pitch forks, manure forks, large drive belts as used on threshers, etc.; cutter bars on mowers, binders, combines, and windrowers; pecking or snapping rolls on huskers and corn pickers simply can't be protected without preventing them from doing the job for which they were intended. In these cases, as in cases of highly inaccessible gears and pulleys it will be up to the farmers and operators to be careful in order to prevent accidents.

Farmers must learn that accidents just don't happen. Carelessness causes accidents! The terrible toll on farms will continue *unless* every farmer becomes aware of his little errors in judgement; the little chances he takes; the small, minor repairs he neglects to make. Stopping all farm machinery before making adjustments, oiling, trying to unclog the machine, or just finding out what's wrong *would* cut, down accidents tremendously in just one year. If we could stop all accidents on farms in the United States for one year, we could produce in terms of added man-hours seven extra bushels of wheat for every U. S. citizen.

Safety is no trifle—but trifles taken care of may save a life. Let's all help our farmers realize that there is a great future in farming, but they'll have to be there to enjoy it.

Safety-wise farmers make a habit of:

1. First class maintenance and conservative operating procedures on all farm vehicles and implements.
2. Continuous upkeep on all building—repairs to stairways and ladders—safe storage of flammables—protective guards on cisterns, wells and pits.
3. Never travel on roads or highways without proper lights.
4. Properly using hand tools, particularly pitchforks.
5. Care in handling animals, especially those with new-born young.
6. Regular inspections of electrical and heating facilities.
7. Wearing well fitted, snug clothing that won't snag.
8. Training children in good, sound habits of safety.
9. Operating tractor at a top field speed of 4½ m.p.h.—and not over 15 m.p.h. on highway.

### Get Safety Down to the Community Level

Whatever else can be recommended let's decide to get the final safety education and practice down to the local community—get all in each community to cooperate, and we'll soon have a good national safety record on the farms of America. Better safety education in each neighborhood and on each farm should be the aim of all publicity and all planning.

In our industry, emphasis on safety on the farm is no accident. For many years we have cooperated with the *National* Safety Council and farm organiartions, state and local safety departments, in every conceivable and practical way. From farm machinery companies come leaders, funds, ideas, posters, and a thousand and one things necessary to execute a good effective farm safety program. Many other firms and individuals participate in this important work. Each year the Advisory Council of the

Farm Equipment Institute distributes a special farm safety poster nationwide just prior to National Farm Safety Week.

The October, 1948 issue of *Cornet* magazine had an excellent article on the National Safety Council. It helps sell the organization that we help and which in turn helps sell safety everywhere. National magazines, daily papers, and small town newspapers are all cooperating to advance the cause of safety.

During Farm Safety Week and throughout the year most members of the farm equipment industry, the oil industry and other industries take a leading part in the educational and advertising activities of farm safety. Many of our movies deal with this subject. Outstanding is Sinclair Oil Company's "The Miracle of Paradise Valley."

We all like our government because it's still ours. Our officials are still our servants as well as our political leaders. Let's keep it this way particularly on safety matters. Let's cooperate, but let's not get to the point where the government has to tell us what to do. Remember, every time you ask the government to do something *for you*, you increase the power of that government to do something *to you*. Industry is spending millions of dollars to help save farmers' hands, legs, eyes, fingers, feet, and lives. We'll continue to do so because it's right and because it pays.

Accidents are one of the leading causes of death and a chief cause of lost man-hours in America. But unlike other leading killers such as heart disease, cancer, tuberculosis, we know how to prevent these accidental deaths and losses without further research if we can get everybody to stop, look, and listen. We have of course a tremendous educational job to do to make people more thoughtful and more courteous and more careful.

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## Interpretation and Use of Farm Accident Statistics

By T. C. M. ROBINSON
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U. S. Dept. of Agriculture

Farm-accident statistics perform a useful function in that they presumably shock the farm population into a realization of the seriousness of farm accidents as a cause of death, reduced efficiency, expense, and suffering.

The fact that during 1947, according to National Safety Council approximations, 19,500 farm people died from accidents should go a long way toward convincing even the most complacent that farm accidents are not to be taken lightly. Perhaps this figure on fatalities will mean more to most of us if it is converted to a rate of 66 deaths per 100,000 farm people, or an average of over six farm people per county in the 3,000 odd counties in the United States.

To date, information about all except the fatal farm accidents has been extremely incomplete. There is no "cause-of-accident" report filed with any government agency in injury cases that is comparable to the "cause-of-death" finding by local coroners. Also, whereas fatal accidents are almost universally reported in at least the local papers and can be picked up by maintaining a careful clipping service, non-fatal accidents, even those which result in serious injury and considerable loss of time, are not ordinarily recorded in the press, unless the injured person was a prominent citizen or the circumstances attending the accident were unusual.

If complete and serviceably accurate information as to total amount of time lost by farm people as a result of accidents, number of permanently disabling farm accidents occurring each year, number and age of dependents left by fatally injured heads of farm households, and total direct medical cost of accidents to farm people were known, each of these statistics would probably be more shocking than the simple statement that 19,500 people living on farms were accidentally killed during 1947.



Detailed information on both fatal and non-fatal farm accidents by type, cause, and location and by age, sex, and activity of the injured serves a wide range of needs.

First, information of this kind makes possible development of improved machinery and structures to lessen the accident hazard. Such necessary parts of agricultural machines as rotating shafts and rolls, cutting knives, and high-speed belts and chains constitute real hazards if they are inadequately guarded. A detailed study of accidents that have occurred, including all contributing factors, often makes possible the design of protective housings or other devices which materially reduce or eliminate entirely, the hazard in question. Use of ramps to replace steps, substitution of stairs for ladders in barns and of pulleys for lifting and carrying, installation of spark arrestors on chimneys, protection of farm buildings, particularly barns, by lightning rods, and construction of hand rails and grab-bars are examples of changes in fixed structures which materially lessen the likelihood of the occurrence of certain types of accidents.

Second, detailed analyses of large numbers of fatal and non-fatal accidents often make possible the development of safer techniques for the use of existing equipment and the formulation of safety rules, the meticulous observance of which greatly lessens the likelihood of accidents. We can all think of dozens of safety rules like "never lead a bull without a bull staff," "always walk facing traffic," "never try to clean a fouled husking roll while the roll is in motion," and "don't over-drive your head lights." Information that shows the relative incidence and severity of the various types of farm accidents would permit the greatest emphasis to be placed on the prevention of those classes of accidents which occur more often and which result in the more serious injuries.

In addition to making possible the redesigning of farm machinery, modification of farm structures, development of safe procedures, and formulation of safety rules, none of which functions are ordinarily performed by farm people, detailed and exhaustive information relating to farm accidents furnishes a factual basis for educational campaigns directed at farm people themselves.

The mechanical safeguards and the improved techniques mentioned above must be accepted by the farm population if they are to result in an actual reduction of the staggering farm-accident bill. A protective housing for a power-take-off does no good if it is removed by the farmer to save time. A State law prohibiting pedestrian traffic on the right-hand side of the pavement has failed in its purpose if farm children continue to walk with traffic on their way to and from school. Knowledge on the part of a safety engineer that kerosene is not a safe material with which to start kitchen fires is of little use if hurried farm housewives, through ignorance or carelessness, persist in starting kitchen fires in that way.

If these safety devices and rules are to be generaly accepted, the reasons for them must be widely publicized through the use of all available media such as posters, the press, radio broadcasts, and personal contact work in the various farm and youth organizations. Upon their general acceptance depends any substantial reduction in the incidence and cost of accidents to farm people.

I believe that more adequate farm-accident statistics would be used also as an actuarial basis for the calculation of premium rates by casualty companies that write accident insurance on farm operators, members of their families, and farm workers, as well as workmen's compensation insurance on hired labor. The greater the uncertainty as to the probable incidence of an undesired event, the larger the premium "loading" must be to protect the insurer against the possibility that the anticipated incidence will be exceeded. Therefore, if information in regard to the incidence and cost of farm accidents were available on a scale comparable to the information that is currently available in regard to nonfarm accidents, it seems probable that the premium rates of accident insurance on farm people and workers would be materially reduced as the companies would not have to rely solely upon rather limited information in calculating their premium rates. In addition, differentials between existing rates, as on farm operators and hired farm workers, might be altered on the basis of more complete information.

It must be admitted, however, that the

experience of insurance companies will ordinarily be less favorable than would be expected on the basis of all the people in a given population or occupational group. The higher claim rates are ordinarily due to two factors. First, the poorer—that is, the more accident-prone—risks are more likely to be insured. Second, the availability of insurance benefits, particularly of the required waiting period is short, encourages a cessation of regular activities in borderline cases.

Farm-accident statistics may be put to many other minor uses. It is possible, for instance, that members of certain age groups cannot safely operate certain machinery; if so, the danger of permitting children or elderly people to operate such machinery should be thoroughly publicized.

A first consideration in the interpretation of farm-accident statistics is that the population and the phenomena in question be clearly defined. If, by farm accidents, we mean accidents to the farm population, it would seem desirable that the definition of the farm population used by the Bureau of the Census should be followed, that is, "all persons living on farms." If we consider that a Census "farm" is any tract of land of 3 acres or more on which some agricultural production takes place, or any tract of less than 3 acres on which the value of production during a year is $250 or more, we must realize that the Census definition of the farm population includes two large groups which are not generally thought of as "farm people."

The importance of the definition of the farm population used arises from the fact that these groups classed as farm people, who we don't ordinarily think of as part of the farm population, probably do not have the same kinds of accidents or in the same proportions as do members of the more generally recognized farm families.

Another group whose accidents are almost universally called farm accidents, although a more exact nomenclature would be farm-work accidents, are farm workers who do not live on farms. In computing accident rates, accidents occurring to farm people should of course be related to the total farm population, whereas accidents that happen to people who work on farms should be related to the number of people working on farms. The two populations are far from identical, for the former includes many who do no farm work, such as children, housewives, and nonfarm workers who live on farms, but it excludes farm workers who do not live on farms.

The second term that requires definition is "accident." The Winston Dictionary defines an accident as "an unexpected or unforeseen event, generally unfortunate." This is the way in which the word "accident" is ordinarily used by each of us when we are not thinking statistically. For some purposes it is a perfectly good definition. The upsetting of a load of hay is an accident, potentially dangerous and expensive, whether anyone was actually hurt or any property was actually damaged in that particular upset or not. A fall down the stairs which results, fortunately, in only very minor bruises and temporarily lost dignity, is still an accident, and everything possible should be done to prevent it happening again. Insofar as these non-serious accidents differ only by chance from accidents which result in serious injuries, information about the condition resulting in the non-serious accidents would help to prevent similar accidents that might involve serious injuries.

However, in practice, most individuals soon forget mishaps which they consider minor because little or no property damage or injury to persons was involved. Therefore, it is practically impossible to get anywhere near complete coverage of such "minor" accidents by means of a survey covering more than a few days. The expense of collecting accident information ordinarily precludes the making of frequent surveys. Therefore, the questions asked ordinarily relate to several months, and sometimes to a whole year. Under these circumstances it would be naive to expect to obtain usably complete information as to accidents that involved little property damage or little lost time on the part of the injured.

In the industrial field, one day's lost time is ordinarily taken as the lower cut-off point for the reporting of accidents. In view of the virtual impossibility of obtaining more than fragmentary information on accidents that involve less lost time, and in an effort to achieve a nominal comparability between farm- and industrial-accident statistics, an accident is currently defined by the Bureau of Agricultural Economics



as one which involves lost time of one day or more by the injured from his or her regular activity. This definition of accidents, which is probably entirely satisfactory when applied to industrial workers, leaves much to be desired when applied to the farm population or farm workers. It is very difficult to evaluate injuries to infants and small children in terms of time lost from their regular activities. A month-old baby lies in his crib whether or not he has a broken leg. A three-year old child continues to play, with his broken arm in a sling. Also, farm operators and members of their families tend to continue their work despite injuries which would put an industrial wage-worker off the job for a day or more.

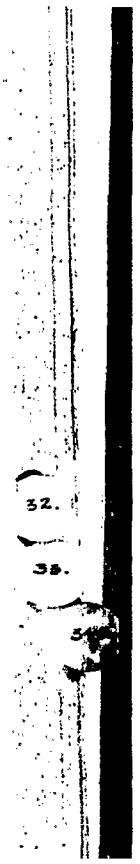
In the case of farmers, the work is there to be done right then and there is often no one else to do it. Therefore, they may work more slowly, but as long as they are able to work at all, they may do so. The same thing is true, perhaps to an even greater extent, of injured farm wives and mothers. Particularly if there are small children, there is often no alternative to keeping on with the regular activities of cooking, keeping house, and caring for the children. Even hired farm workers may be shifted to less strenuous tasks when injured and still be kept on the job. Therefore, physical injuries of identical severity often result in less loss of time to farm people and farm workers than to industrial workers.

A further difficulty is encountered in obtaining information on accidents that involve one or a few days lost time. Whereas industrial employers are ordinarily in a position to report such accidents on the basis of currently maintained records, very few farmers keep such records. Farmers must therefore depend upon memory. It is obviously very easy to forget or to overlook a rather minor accident that occurred several months before.

A minor difference between the definition of an accident generally used by safety and governmental organizations and that used by accident insurance companies should perhaps be mentioned. Insofar as the definition used by the insurance companies is concerned, some untoward and unforeseen event must have occurred outside the body of the injured person before an accident is considered to have occurred. For instance, if a man attempts to lift one end of a heavy piano and, without his feet or hands slipping, strains his back, his injury is not considered by the insurance company to result from an accident. However, if he trips or stumbles while carrying the piano and a similar injury results from temporary loss of footing, such injury is considered as an accidental injury. In other words, the means producing the result, as well as the result itself, must be accidental, and there can be no recovery from the company where injury results from the voluntary act executed in the expected and ordinary way.

With the exception of administrative statistics collected by government organizations, incidental to the operation of workmen's compensation State funds, and by casualty insurance companies, in connection with workmen's compensation insurance offered in noncompetitive and competitive States, accident statistics are ordinarily obtained by means of sample surveys rather than from complete enumerations. The sampling approach is necessary because of the high cost per schedule of information obtained by personal interview.

It is, of course, only by personal interview that a complete census of any phenomenon can be taken, for if a questionnaire in regard to accidents is mailed to each farmer in a state only a relatively small percentage will reply. Surveys are made by mail in some states, but the interpretation of the survey results is difficult because of the selective nature of the returns. Operators of farms on which serious accidents have occurred are much more likely to return questionnaires than are operators of farms on which no accidents or only minor accidents have occurred. Information as to the causes and conditions surrounding an individual accident are just as valuable if they are obtained from an unrepresentative mail sample as from a representative sample or a complete census, but estimates of the incidence of the various categories of accidents are of doubtful utility if they are based on unrepresentative samples. Therefore, the Bureau of Agricultural Economics has used a scientifically designed, preselected sample of farms in each of its farm-accident surveys. Field work on the third of these was completed in October, 1947.



In this most recent survey, more than 10,000 farms in about 400 of the 3,017 counties in the United States were visited, and their operators were interviewed in regard to any accidents which may have happened to them, to members of their households, to members of other households on the farm, or to other people working on their farms during the months of May through September. The sample used is a representative sample in which farms of every type and size are included in the same proportions as in the total universe, which includes all farms in the United States. Therefore, survey results may be thought of as valid and representative except insofar as the number of accidents of a given type or other category included are very small. For instance, our April, 1948 survey uncovered only eight fatal accidents on the 11,541 farms covered in the sample. With such a small number of cases, we could not attempt to estimate the number of fatal accidents in the United States as a whole. Such an estimate, which would work out at just over 3,500 fatal accidents for the first third of the year, might be 200 per cent too high or 40 per cent too low.

In addition to errors due to small samples, other errors may be present in the survey results because of incomplete or biased reporting. Individuals being interviewed or filling in a questionnaire tend to report occurrences which seem important to them but to overlook occurrences to others which have had less impact on their own consciousness, and this tendency may result in serious distortion of presumably comprehensive accident information.

An outstanding example of such respondent bias in the nonfarm field occurred recently when a prominent national service organization in cooperation with the public schools conducted an accident survey of a southern city. Questionnaires were taken home by the school children, presumably to be filled in by their parents. When summarized, the results showed a much higher proportion of accidents to children of school age than had been anticipated on the basis of prior information. This bias undoubtedly resulted from two circumstances. First, the population sampled consisted entirely of households having children of school age, so the age-group distribution of members of the sample households differed significantly from that of all households. Second, on the whole the children took the survey more seriously than did the parents, so that much more complete coverage was obtained on accidents to the children themselves than on accidents to other members of their households.

A farm-accident survey recently made in one of the northeastern States in cooperation with teachers of vocational agriculture may be cited as a second example. Questionnaires were distributed by vocational agriculture students to farms which they themselves selected. The farms on which the students lived were almost always included. When summarized, the survey showed a disproportionately high accident rate among adolescent and young adult males. Again, the sample selected was apparently unrepresentative in that it included too many farms on which adolescent males were living, and the resulting bias was compounded by the fact that the boys saw to it that the accidents which they and their near-contemporaries had suffered were more completely reported than were accidents to women or girls or to very young boys or middle-aged and elderly men.

In the case of the two Nationwide farm-accident surveys which have been made thus far by the Bureau of Agricultural Economics, more incompleteness of reporting accidents to members of nonoperator households than to members of operators' households seems probable as the person interviewed was ordinarily the farm operator.

The user of any set of farm-accident statistics must know the answers to the following questions before he can use the statistics with confidence:

1. What is the population or universe which this survey, or these administrative statistics, relate to?
2. How was an accident defined?
3. How was the information obtained?
4. If from a sample, was the sample fairly representative?

Possession of the questionnaire or record form on which the accidents were reported so that the exact wording of the questions can be studied helps in detecting possible sources of bias.

Due to the very fragmentary coverage of the farm-accident field insofar as statistics are concerned, it is often necessary to generalize for a broad geographical area on the basis of information obtained from a smaller area, such as a township, county, or state. Generalizations of this kind should never be made blindly but always with the reservation that the conditions which give rise to the various types of accidents are not exactly the same in the two areas. Dissimilarities in conditions which might result in somewhat different accident patterns should be noted and rough adjustments should be made to fit facts for the surveyed area to the conditions in the unsurveyed area. If uniformity of definition can be achieved, preferably through the use of standard questions, it should be possible, as more and more county, state, and nationwide surveys are made, to collate the survey results and thus to gain a clear and comprehensive picture of the type, causes, severity, and costs of farm accidents and the characteristics of the injured persons, by states and regions. When we have reached that happy condition, interpretation of farm-accident statistics will be much simpler and their use much safer.



## A Safety Program for Farm Women

By MRS. ROY C. F. WEAGLY
President, Associated Women, American Farm Bureau Federation

The simple words, "farm home" give one an impression of tranquil safety, but what a false impression! Many parents residing in the cities are of the opinion that if their boy or girl could spend two weeks in a farm home they would experience the safest vacation in the world.

That could be a true picture but, unfortunately, it is not. Farm home living should be the richest, safest and most satisfying way of life. It could be so, if all farm families were adequately informed and willing to cooperate in a positive safety education program, and were eager to eliminate all accident hazards.

Farm home living that is safe, satisfying, and successful is our national goal. Other objectives are but steps toward this ultimate end. While we are by no means near its realization today, yet its achievement has become a matter of pressing necessity.

Farm home safety is practically new to many farm families. The fact of the matter is that, for too long, farm people were obliged to get along with makeshift equipment, under poor conditions, that it made them somewhat apathetic, and they learned to ignore the hazards which surrounded them in their daily work. Many tasks are so routine and commonplace that farm people have become so used to them that they consider the possibility of accident very remote. Yet those very situations are responsible for many deaths and crippling injuries.

There are more farm home fatalities than any other type. Last year 6,000 persons were fatally burned in kitchens alone.

Now, when farm people, generally, are in a more favorable position to take advantage of newer and safer equipment, they have to learn all over again how to do things the safe way and with safer equipment. There is a safe way to do every farm and household job and an unsafe way, too. The choice is up to the individual. It is only by being alert and practicing safety every minute that one can hope to escape injury or death.

Before dealing with the tangibles, however, whether they be in the home or outside, there are two intangibles that must be developed and cultivated. First, the attitude of the members of the family; second, the fortitude on the part of each family.

The attention of the farm family must be captured by the astounding number of farm home accidents. Many of these could have been avoided. The farm family must recognize the need for an accident prevention project in their own home. They must be made to realize that other farm families could also profit by community safety activities and thus challenge the support of all for their mutual benefit.

In the past year, the four leading causes of home accidents were falls, burns and explosions, poisons, and poison gas. If we were to do away with falls and burns alone,

we would eliminate almost 70 per cent of home fatalities. The strange thing about it is that no age is immune from any type of home accident, but falls are the chief concern of people advancing in years. Burns and poisonings take their greatest toll among children up to four, and burns are frequent in the five-to-fourteen age group.

Accident booby traps are found in the yard, the kitchen, outside stairs, inside stairs, living room, porch, bedroom, and basement. The causes can be attributed to tools and other objects, slippery surfaces, disorder in the home, improper use of equipment, carelessness, neglect, and hurry.

In too many instances, the homemaker is responsible, either by example or precept, for the conditions which make the farm home a dangerous place. Many young mothers, through no fault of their own, never received training for parenthood nor for homemaking. They are, therefore, in dire need of safety education.

Almost half of all falls on farms last year were fatal, over 14,000 deaths. Sheer carelessness is almost the complete blame for this constant rise in home accidents. And yet it has been reported that at a meeting of the New York 4H Health Committee, held in Syracuse in May, members of the New York State Health Department said that they are becoming more aware that health, environmental conditions, and disease were the principal causes of accidents. Sulfa drugs, phenobarbital, and epilepsy cause many accidents. These accidents were said to occur among the very young children under five and the older persons in the home. According to that report, 20 per cent of the people have 80 per cent of the accidents, and some people have been found to be prone to accidents.

Following, I have listed some of the attitudes essential to safety:

1. Believe that most farm home accidents can be prevented.
2. Feel a personal responsibility for practicing safety.
3. Be alert to accident hazards and unsafe practices.
4. Believe accident prevention should be a continuous family project.
5. Encourage safety education in rural schools.
6. Cooperate in community education activities.
7. Utilize every opportunity to expand safety education.
8. Know first aid and have a first aid kit available.

Fortitude will be required to change unsafe habits and vigilance will be necessary to carry out the following safe practices:

1. Cultivate the ability to "see" fire and accident hazards.
2. Correct those hazards immediately.
3. Use a play pen for children under 12 months of age.
4. Instruct children in safety—teach them the safe way.
5. Keep children away from operating machinery.
6. Keep pans and dishes out of children's reach.
7. Keep handles turned back from the edge of cooking range.
8. Keep matches and sharp instruments out of children's reach.
9. Label poisons and store in special cabinet away from children.
10. Avoid open vessels of liquid hazards for children.
11. Keep dangerous tools away from play areas.
12. Keep yards free from nails, broken glass, etc.
13. Provide special containers for broken glass, etc.
14. Have folding gate at open stairways to keep children safe.
15. Keep window screens latched securely out of children's reach.
16. Remove ladder when it has served its purpose, or it may invite children to climb.
17. Avoid leaving small children alone in the bath tub.
18. Have a place for toys and teach children to put them away.
19. Keep children away from ironing board and dangling cord.
20. Keep small children away from stock pens and barns.
21. Teach children and youth to respect fire.
22. Read label before using contents of any bottle.

Electricity may be a boon to the housewife, or it can be a boomerang. If used carefully, it lightens the labor in the home but it can be just as dangerous as a match,



a gun, or a 2-year old colt. Electricity is used safely by millions of people. Accidents are not the fault of electricity; they are the fault of people. Here are some tips to remember:

1. Have hands thoroughly dry when turning on current for light or electrical equipment.
2. Have all pull chains provided with insulated links.
3. Keep electrical cords in good condition.
4. Place electrical cords to prevent tripping and free from wear.
5. Avoid hanging anything over electrical wires.
6. Disconnect electrical equipment when not in use.
7. Have lamp near bed within reach for safety in the dark.
8. Have all electrical connections out of reach from bath tub.
9. Have an automatic hand release on washing machine wringer.
10. Have metal frame of electric washer grounded or insulated with rubber.
11. Know the location of cut-offs for electricity, water, and gas.
12. During an electrical storm, avoid standing under a lone tree, near wire fence, or in open doorway. Also avoid drawing water from metal faucet.

There is now on the market a fluorescent lamp, the size of a walnut, which costs about 2½ cents a month to burn continuously. It is a safety beacon and convenience light for stairway, nursery, bathroom and hall. A hint to the wives is sufficient.

1. For every stairway have a hand rail on at least one side.
2. Have stairways well lighted and free from obstructions.
3. Have top and bottom basement steps painted white for better visibility.
4. Keep steps in good repair.
5. Have a safe place for storing household equipment.
6. Keep floors free from liquids and avoid slippery condition.
7. Avoid the use of stepladder substitutes for reaching high places.
8. Skid-proof stepladder with pieces of rubber innertubes.
9. Skid-proof scatter rugs with pieces of rubber.
10. Provide grab bars or non-skid mats for bath tubs and showers.
11. Keep sharp knives separate from other utensils.
12. Use proper tools and gadgets when working in kitchen or repairing things.
13. Use pot holders when handling hot pans and dishes.
14. Bend knees instead of back when lifting heavy objects.
15. Remove ice from porches and walks or sprinkle with sand or cinders.
16. Keep guns out of reach of children. The best place is under lock and key.

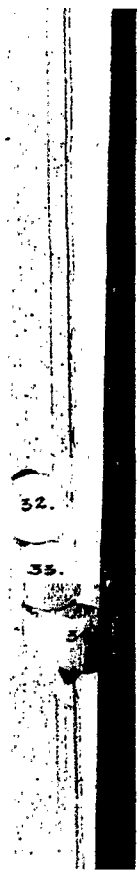
It is estimated that 3,500 lives will be lost in farm fires this year; $225,000,000 in farm property will be destroyed. Four farm buildings will be destroyed by fire every hour. "An analysis of fire causes has shown us that 90 per cent of all fires could be prevented if simple, common fire hazards were removed."

Too frequently fire hazards are removed only where visible to the public eye, but in attics and basements a different picture is found.

Here are more tips to remember. If one is safety minded it will not be difficult:

1. Use non-flammable, non-explosive fluid for dry cleaning.
2. Store cleaning fluid in closed containers.
3. Place oily rags in closed metal containers.
4. Avoid using kerosene or other flammable fluid to start fire in the kitchen stove.
5. Have heating plant, stoves, flues and chimneys cleaned yearly.
6. Remove ashes and store in a metal container.
7. Use asbestos or metal stand for electric iron.
8. Keep water supply available in case of fire if no running water in the house.
9. Have an approved type of fire extinguisher at hand.
10. Have boxes of sand available to supplement other equipment.

Believe it or not, the usual house dress presents hazards: Button-down-the-front closings catch on knobs, chairs, etc.; large patch pockets catch, too. Skirts may be too tight for climbing or stooping; skirts may



be too full or too long that heels catch when climbing or stooping. The farm woman, generally, has work outside the house which requires the use of tools, such as rake, power mower, etc.

When planning new house dresses, one should have:

1. Slide fastener' fronts, instead of buttons which gap.
2. Set-in pockets or patch pockets stitched with elasticized thread to hold top close to body.
3. Square armholes for comfort and freedom.
4. Correct length and fullness for ease and safety.
5. Avoid bows, ruffles, loose belts and flowing sleeves.

Safety training is merely good citizenship training.

Safety is everybody's business. With united efforts we can save human life, conserve material resources, and make farm home living safe, satisfying and successful.

## 4-H Club Contribution to Safety

By KENNETH ANDERSON
Associate Director, National Committee on Boys and Girls Club Work, Chicago, Ill.

I should like to briefly review the progress of the National 4-H Farm Safety Contest which is now in its 8th year. As most of you know, the program itself is carried out under the direction of the federal, state and county extension services, with the schedule of awards provided by General Motors Corporation. A number of states had carried out a 4-H Safety program prior to the inception of the national contest in 1944, but the national contest has provided an organized procedure whereby all states work toward the same common objectives.

Although final statistics are not available for 1948, our best estimates on results are these:

Number of states accepting the contest—44
Number of states qualifying for state award—40
Number of members qualifying for medals—2,100
Number of counties naming winners—700
Number of members enrolled—265,000
Number of members participating in the contest—145,000.

Are we making progress? The answer is *definitely yes*, although there is *much more* to be done. In the past five years, the number of counties participating to the extent of naming county winners has increased by 250. More significant, the number enrolled has doubled, and the number participating in the contest is nearly five times as great as in 1944.

We don't believe this progress is due alone to the incentives offered in the contest. But it is due in large part to the tremendous promotion the National Safety Council has put behind the cause of safety.

Three things stand out as we have observed the progress of 4-H safety work during the past year:

1. There is more emphasis on demonstrations.
2. More emphasis on highway safety.
3. Better planning of programs with the club and county-wide approach more commonly found.

For the time, money and effort expended, I believe that more can be accomplished with youth in the safety field than with adults. Young people, I believe, are open-minded and receptive. They are joiners and like to participate in organized efforts. They usually have more time than adults and their persuasive powers with parents and neighbors are great.

When I say don't underestimate the power of the 4-H Club member, I like to turn to some of the reports of the 1947 national winners. Let's see what they have done.

The girl from Oklahoma reports that she made a survey at home and corrected 37 hazards, all the way from repairing two rungs on the kitchen chair to labelling medicine bottles. These are simple things, many of them, but they may relieve suffering or death.



You can become safety conscious doing small things, as the Wyoming winner points out: "The best thing about safety is that no matter how much or how little you do, you have accomplished something that is for the betterment of everyone concerned. There is no such thing as doing a poor job in safety work. Every little bit helps."

Safety begins at home but usually expands to community-wide effort. As the Maryland winner points out: "In previous years many safety projects began and ended at home. I now realize the importance of expansion. I am encouraging all 4-H members in my community to plan a campaign for their own home and for their neighbors' homes."

Community-wide effort is exemplified in the report of the Arkansas winner who says: "Our club went 100 per cent into the safety campaign. I have checked personally every home in our community and a large part of the accidents and fire hazards have been removed. Eighteen homes made first aid kits."

The impact of the work of these 4-H members is exemplified in the report of the New Mexico winner who says that over 500 hazards were corrected in her community. Activities which brought this about were a talk at a county-wide 4-H members meeting, a committee representing each of the 14 clubs in the county, foll calls and discussion topics, distribution of safety literature, demonstrations at community meetings, a radio program, school safety program, news articles in every county paper, and booths on safety.

The Wisconsin winner sums it all up very nicely by saying: "The real reason why farmers are careless is because they do not realize the danger of their work. They are around it every day, generally alone, and usually they are unaware of the dangerous things they do day after day. To stop farm accidents, we must make the farmers conscious of the danger spots on their farms and show them what to do to prevent them."

In this national contest, plaques are presented for the best county-wide programs. A typical county-wide program was presented by the Arkansas winner who was from Jackson County. A county-wide committee was formed which met with the 11 local clubs in the county, and safety was discussed with 576 4-H members. Safety captains were selected for each club and 523 surveys were made by the 4-H members. Talks, safety survey blanks, radio, newspaper publicity and demonstration reports reached almost all the families in the county.

In El Paso County, Colorado, all 4-H clubs in 24 communities had safety programs. In Tompkins County, New York, 308 4-H members participated in the safety contest. Thirty-six special programs were held in the interest of safety at schools, community clubs, farm organizations and fire insurance meetings. A three-year county-wide program of safety and health was inaugurated.

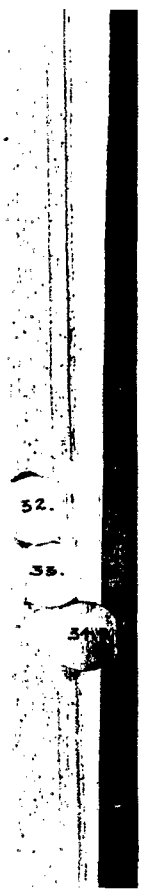
Dyer County, Tennessee, reports that 937 4-H members participated in their county-wide program.

States ranking high in counties qualifying for awards in the 1947 Safety Program:

1. Georgia .....60
2. Minnesota .....59
3. Wisconsin .....45
4. Illinois .....45
5. Arkansas .....43
6. Texas .....42
7. North Dakota .....28
8. Oklahoma .....24
9. Florida .....20
10. Indiana .....19
11. North Carolina .....19

States with highest percentage of counties qualifying for county awards:

1. Rhode Island .....80%
2. Minnesota .....67%
3. Delaware .....66%
4. Wisconsin .....62%
5. New Hampshire .....60%
6. Arkansas .....57%
7. North Dakota .....53%
8. Illinois .....44%
9. Wyoming .....39%
10. Georgia .....37%
11. Oklahoma .....31%



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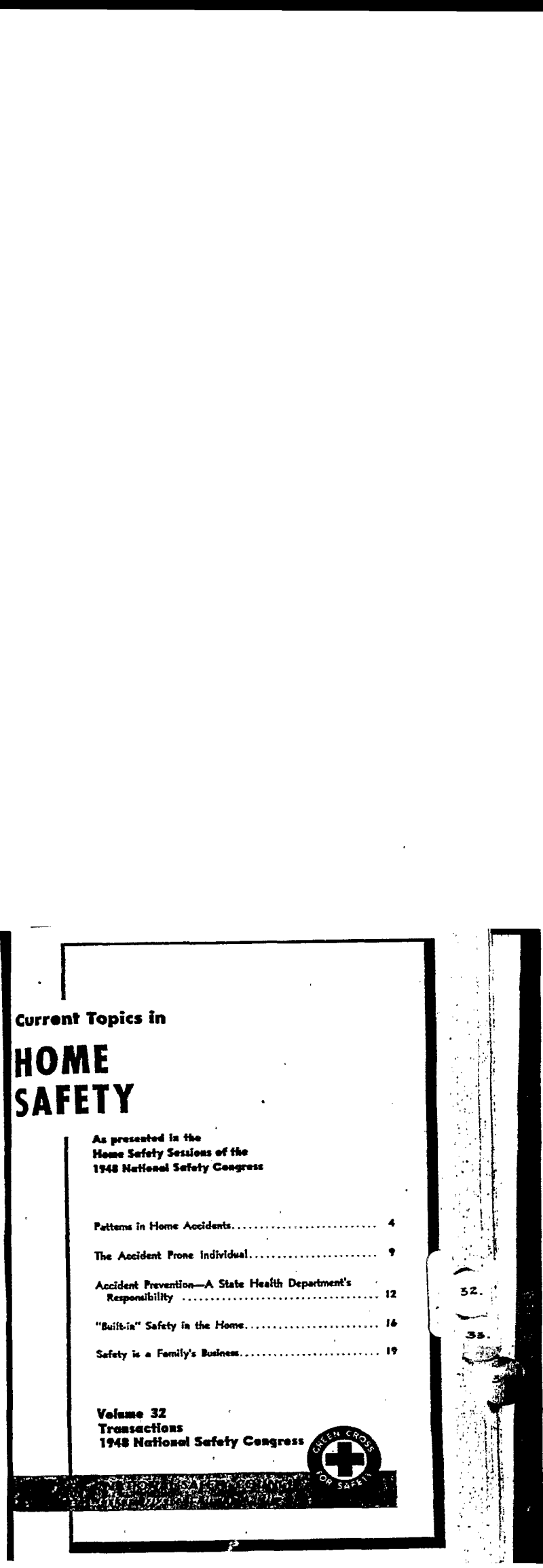
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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.





## THE HOME SAFETY CONFERENCE

This volume is a record of the sessions held at the 1948 National Safety Congress by the Home Safety Conference. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Conference carries on for the benefit of accident prevention work in the home. The activities of the Conference are under the direction of the officers of the Conference listed on page 23 of this volume.

# Patterns in Home Accidents

By DR. JOHN E. GORDON
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The responsibilities of physicians in the problems presented by health and disease have been stated in simple fashion as the obligation first to prevent disease; if that is not possible, to effect a cure; and if that proves impossible, to alleviate suffering.

Doctors of medicine as a profession approach the problem of prevention in two ways. The first is through that intimate and universal relation which exists between the individual practitioner and a single patient. The advice he gives and the measures he takes are preventive medicine. The contribution that results is a major part of what doctors give to the prevention of disease, first because of the numbers of doctors and of people concerned, and secondly because the action is directed toward a determined need, a known cause, and to a specific circumstance.

But the health problems of man are not the simple summation of the ills of the *individuals who make up a given population* or community. The misfortunes of one act on the well being of others. There are causes of disease and injury which are beyond the control of the individual, to be eliminated only by group action. There are sick communities as well as sick individuals, and it is the community that the public health physician has as his patient. This, then, is the second way in which the physician approaches prevention, as a problem of populations rather than individuals, and the medium is known as public health.

While the primary objective of public health is to prevent disease of the community, circumstances commonly require the same compromise as in clinical medicine, the need to be satisfied with something less than the perfect result of prevention, to control or limit disease that cannot be prevented and to decrease the costs in terms of community health when neither is successful. All three are a positive contribution to prevention although in progressively lesser degree.

A successful and intelligent practice of medicine as it relates to the individual patient depends first on a clear recognition of the character and extent of a disease process, upon diagnosis, and secondly upon a treatment designed for that particular circumstance and that particular person. The same principles hold when the community is the patient.

The counterpart of the discipline of clinical diagnosis is that of epidemiology, with the obligation to evaluate the ills of a community. It is that of which I wish to speak. I have purposely refrained from using that term in the title of this paper, and I shall in the discussion to follow. After all, epidemiology consists of no more than defining the patterns of disease, but that is most important because it determines to a great degree the reasonableness and the success of measures that are applied to remedy a situation.

I would make one more point before turning to the special question of home accidents. When *the problem is that* of the cure or alleviation of disease in the individual, that is a function wholly of the physician through his special skills and the knowledge derived from his profession. Prevention is something else. The principle is firmly established that the control of community health is a community obligation, a team effort requiring a variety of skills, that of the engineer, the public administrator, experts in sciences allied to medicine, the social service worker, the sanitarian, the safety officer, and of course the physician.

The doctor has his contribution to make because his business is health. But depending on the nature of a community problem, his part may be dominant, as it is in the health of the new born and of infants, or secondary, as I feel it is in accidents, taking the problem as a whole. But he does have some obligation in every community problem that leads to death, defect, or disability. I venture that one of the reasons that physicians have failed to interest themselves as they should in the prevention of accidents is a failure to dissect the problem. Many fields in accident prevention are clearly the primary responsibility of others, the safety engineer in industry, the police and other law enforcement authority in motor accidents, these and many others in the diverse accidents that occur in public places. Nevertheless, the physician has a recognized duty in all these fields, as a technical expert and as a public health officer.



The accidents that occur in homes are something apart. This important group accounts for more deaths and far more disabling injuries than any other of the four great categories into which accidents are divided. I believe that the home is the particular province of public health and preventive medicine, and I see no other promise of successful approach except through these agencies.

If home accidents be a primary problem of community medicine then it seems reasonable to apply to its solution the techniques upon which all community health practice is based, whether the question is of the communicable diseases or cancer, diabetes, nutrition or other. In essence, this includes first an epidemiologic analysis of the broad problem and then a focal attack where the condition is determinably most pronounced, through specific educational techniques and the demonstration of preventive measures by public health nurses or other health visitors in the homes of people. The definition of patterns is the first requisite. In presenting this method of medicine as an approach to accidents that occur in homes, the suggestion is left that these techniques may be applied to advantage in other fields of accident prevention not so clearly within the responsibility of the doctor.

## Objectives

The reasons for an interest in the patterns of home accidents are simple—to find out when and where these events take place; how they occur, which is to say the mechanism involved; and finally to learn who gets hurt. These matters are vitally practical. Remedial measures are costly. They are time consuming and interest flags if return is not evident. If universally applied, and blanket-wise, they lead to diffuseness of effort and minimal accomplishment.

When the death rates from tuberculosis in Detroit were judged some years ago to be beyond reasonable limits, the attack on the disease was not through a city wide campaign, but through search for those factions of the population contributing in inordinate degree to the total tuberculosis of the city. They were found in the population of three wards, predominantly negro, where intensive control measures produced a significant improvement in the rates for the city as a whole.

The reason then for an interest in the patterns of home accidents or any other community health problem is to direct available preventive measures intelligently and specifically. The demonstration and interpretation of these patterns lead straight to the question of cause, and that is more than the simple tangible object so commonly interpreted as the sole responsible factor in disease or injury, a germ in infectious disease or the loose board in a home accident. Rather it is a combination of forces of origin from at least three sources, neither one nor the other regularly exerting the principal effect. Because this suggests that similar disease phenomena may arise from dissimilar causes, it is necessary to speak briefly of the biologic origin of disease and injury.

### An Ecologic Interpretation of Mass Diseases

The direct causes of disease or injury are many, ranging from microscopic living things to chemical agents such as lead, physical agents of heat, cold, electricity, dusts, fire and a host of others. Disease may also result from the lack of an essential element, such as vitamins. Collectively these are the agents of disease.

A suitable host is essential to the production of disease, and our interest here is in man as the host. The essential consideration is in that qualifying word "suitable." Some ages and some races are individually susceptible to a disease or an injury, and there are variations from condition to condition. There are important differences in organic and psychologic makeup that relate to resistance or to the likelihood of disease. These and many others are the host factors in disease.

Finally there is the environment in which agent and host find themselves. First is the physical environment which includes climate, weather, and similar influences. Secondly, the biologic environment, the whole of the other living things with which man associates, and finally the socio-economic environ-



ment, those things of the surrounding world which arise from man's association with his fellow man such as crowding, economic status, housing, clothing and many others.

An established and satisfactory equilibrium or adjustment between man and his environment leads to the situation called health. A significant disturbance of this equilibrium results in disease or injury. The disturbance may follow through the principal action of the agent or of the host or of the environment, more commonly through their combination.

But what is the practical relationship of all this to the causation of disease or injury? How is it concerned with our particular problem of accidents? May I return to my previous example of the loose board that caused a home accident through a fall. A loose board exists. The likelihood of tripping and falling is exaggerated by its position in the *environment*, whether that be attic, cellar or front steps, by the influence of weather, of season and of daylight or darkness. The *host* may determine the whole event. A careful individual may avoid the most evident danger over long periods, while a minimal provocation suffices for the opposite sort of person. And of the *agent* itself? Big boards may cause little accidents and little boards, big ones. The cause is the summation of these three forces, and what is so frequently looked upon as cause is actually mechanism. These principles are believed to apply equally to disease and injury of the individual and to mass disease of communities.

Many facts are known about accidents in the home. Their interpretation and the relation one has to another are presumably improved by looking at them in these terms of agent, host, and environment. These are the fundamental factors in producing accidents. The mechanism of how they act together in the eventual production of an accident is an equally practical consideration—through burns, falls, crowding and what not—but not the essential question. Basically, what caused the fall?

*Environment*—The primary classification of accidents by the National Safety Council is on the basis of environment, four great categories to include the accidents that occur in homes, in relation to motor vehicles, in public places and where men work. *Judged by the deaths that occur, home accidents are the principal factor in the health losses from accidents since they represent about 35 per cent of the total reported for the United States in 1947. The proportion varies in different parts of the country and from one time to another. The experience of Tennessee shows home accidents to be somewhat less important than those due to motor vehicles, while the data for New York State during the years 1942 to 1946 show almost one half of accidental deaths to have occurred in the home.*

*Geographic Distribution*—Not only is the relative proportion of home accidents to all others a variable feature of geographic regions, but the actual frequency as judged by the number of such events among each 100,000 people differs from state to state. The differences in respect to all accidental deaths are well known and have been recorded over a number of years.

The less comprehensive information about home accidents shows great differences from one part of the country to another. Rates vary from 34.5 in Missouri to those of Utah with 16.8 per 100,000 population. The gross differentiation by states scarcely permits the individual community logically to judge its problem of home accidents. Much depends on the concentration and character of the population as becomes evident when the frequency of home accidents is considered in relation to place of residence, as urban, farm and rural non-farm, for home accidents are clearly a greater problem of urban communities than rural non-farm areas. The reasons are not well defined but the differences are sufficiently great to suggest material variations from community to community. This has been recognized to the extent that some few cities have determined the frequency of home accidents by political subdivision such as wards or census tracts, and states like Tennessee and Kansas have effected divisions by counties. The results emphasize the need for individualized information if communities are to apply proper stress to control measures.

Largely because of the interests of a few investigators, much is known of the inner structure of the home as an environmental factor in home accidents. The data are familiar to most and appreciation is general of the extent to which direct educational measures have followed the demonstration of the hazard pertaining to various features of home life.



*Seasonal*—Accidents as a health problem are a steadily recurring phenomenon corresponding to what is termed endemic behavior in terms of disease occurrence. Little variation occurs from month to month, as illustrated by the experience of Wisconsin for 1946. Specific kinds of accidents are recognized as common to certain seasons, suffocation of infants and falls at all ages predominating in winter. Generally, the information is none too extensive and the knowledge of home accidents would profit by methods used in the study of motor vehicle accidents to determine such time factors as the influence of weekends, of holidays, of periods of bad weather, and of daylight hours as contrasted to those of darkness.

*Biologic Environment*—The biologic factor of environment has minor significance in home accidents compared with the dominant part in such mass diseases as malaria and rabies. That the principle holds and that environment is rationally interpreted in terms of physical, biologic and socio-economic components, is demonstrated by the home accidents associated with pets, with poisonings through action of snakes and insects, and other events related to the animate things that live with man.

*Socio-economic Environment*—Whatever the kind or nature of mass disease or injury, whether it be infectious, metabolic or traumatic, the part exerted by the socio-economic environment is probably the most neglected and underdeveloped of any epidemiologic influence, with accidents no different from any other. Only scattered information can be put together, that arising from the National Health Survey of 1935 being the most instructive. The quality of housing as judged by the amount of income or rental paid has been repeatedly demonstrated to have an influence on the frequency of both communicable and non-communicable diseases. It is not surprising that the same causative influence can be shown in the frequency of accidents. Indeed, many of the physical factors of environment already presented and those of the host to follow will be seen as scarcely independent in their action, but representative of a solid admixture with this component of socio-economic environment.

*Host*—Because the object that directly gives rise to an accident—the faulty pavement, the scalding hot water, the unguarded poison—is so evident, the tendency to think only of that factor in a causative relation is completely human. An enveloping darkness or rainy wet weather, or a crowded tortuous thoroughfare are also readily viewed as contributing to the causation of accidents. But the people who get hurt—they are only the poor victims of circumstance. And yet, when we examine the question, probably more causes of accidents lie within what we choose to call "host factors"—within people themselves—than in any other of the three parts of the triad which explain the causes of disease and injury.

Age is an important determining factor. Considering deaths, the very old are most affected, with the loss of life far less during the active periods of life when conceivably the opportunity for accidents is far greater and the risks much enhanced.

The contrasting liability of the two sexes to accidents is best demonstrated by examining deaths from accidents of specific types. Those associated with falls serve to good purpose. The factor of age is well indicated, with more deaths among those of advanced years than in younger age groups. Equally striking differences are related to sex, in that younger males are far more frequently involved than females of the same age. At advanced ages females outnumber males in deaths from falls by a wide margin. Deaths from cutting and piercing instruments fail to show these differences according to age. The sex differentiation is just as definite. At younger ages males surpass females, but with advancing age the susceptibility becomes more nearly even and from persons past 75 years the differences are non-essential.

The relation of race and likelihood of death from accidents is best illustrated by the particular condition of accidental death from suffocation. Again the age differences are well marked, in that the rates for infants under one year of age are completely out of proportion to those of children aged 1-4 years, but the data are chosen to illustrate another point and that is the discrepancy in respect to race. For this unusual cause of accidental death more than twice the numbers of children succumb among colored than white.

These differences in liability to accidents among the gross divisions of the population



are striking. Each may be subdivided by all manner of other factors which make up the whole of the constitution of the host. Accident proneness is a host factor related to social attitudes and psychologic differences, a subject to be developed in detail by the speaker next to follow. The increased liability to accidents in the wake of fatigue and other physical and mental stresses, the effect of alcohol, all manner of physical defects of which those of the eye and the ear are especially significant, are further examples of host factors too little developed in relation to home accidents, despite the emphasis they have had in industrial and motor accidents.

*Agent*—The information about the precise agents involved in home accidents is none too satisfying because of the common confusion with mechanism by which the accident results. The mechanism is not the cause of the accident. It is the means by which it is brought about, while the causative factors have been seen to reside not only in the agent but in the host and in the environment as well.

A log lying in a park gives rise to a fall which ends in a broken arm. The log is the agent, the fall is the mechanism which characterizes the type of accident. The cause may well be a combination of first the agent as a fundamental essential, of a host with faulty vision, and a rainy day. The broken arm is the accident, the result arising from duly defined cause.

An accident may be described as due to cutting or piercing, to collision or to crushing, and yet the agent in all three instances may be a glass panelled door. Conversely, a fall may be due to such dissimilar agents as a faulty ladder, a playful pup or a misplaced handbag.

### The Epidemiologic Approach to Accidents

The sort of analysis that has been described is believed fundamental to an understanding of the origin of accidents. It involves first a recognition of the agent involved; second the mechanism by which that agent comes into play; thirdly a determination of cause in terms of agent as the direct inciting cause, the qualities of the host who is involved in the accident; and finally the influences exerted by environment.

The kinds of agent involved in home accidents in urban areas are expectedly different from those of rural homes. The several kinds of people vary in their susceptibility to accidents from a single potentially dangerous agent. Either an agent or a host can be particularly unlikely to give rise to an accident under one set of environmental circumstances; under others the agent may be rendered particularly dangerous or the host unusually susceptible to injury by accident.

This is not a complicated, but a rational approach to a better understanding of accidents. It is a scheme followed by several state health departments. The National Safety Council has made a special analysis of home accidents according to this pattern. The investigation forms used in Kansas provide a simple means for recording and acquiring these data. The method needs wider application if the problem of the individual community is to be adequately defined, and better definition has the practical end of permitting more intelligent and specific programs of prevention.

### The Existing Status of the Home Accident Problem

*Much attention has been given in this* discussion to the recognition and evaluation of the various kinds of home accidents. This is the sort of intellectual exercise that doctors call diagnosis. I have likewise made it evident that the reason we are interested in diagnosis is because it so largely determines the efficiency of treatment.

But there is always one other feature of a medical problem with which physicians are concerned, and that is the future outlook, will the patient get well and how long will it take, a question of equal significance in the mass diseases of populations and specifically that of home accidents. I wish to make three points:

The 1947 record for accidental deaths in the United States, of all kidds and from all causes, was appreciably improved over other years, but largely related to a better record for accidents of industry, of motor vehicles or those which occur in public places. The frequency of home accidents goes along year after year with relatively little change. As indicated by the number of deaths that occur, no great progress has been made in home accidents.



Death is not the only health cost exerted by accidents or for that matter with any mass health problem. A common tendency exists with accidents, and particularly with home accidents, to base judgment entirely on deaths. To an extent this is a forced situation by reason of deaths being carefully recorded while cases are not. Estimates indicate that for every death from a home accident about 150 disabling accidents occur, a ratio greater than for any other class of accidents, the ratio for motor vehicle accidents being 1 to 32.

Death is not necessarily the most important cost exerted by a mass health problem, the common cold being in good example. The losses from temporary disability and from permanent defect may be the more serious consideration. Just how important that is in connection with home accidents rests upon insecure information.

The problem of home accidents cannot be approached in its entirety without much better information than now exists. There is neither provision nor opportunity for official reporting of cases as is true of communicable disease. The information so necessary to an evaluation of defect and disability from home accidents would appear to be had most readily through visits to the homes of people in the course of the ordinary activities of recognized health agencies.

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## The Accident Prone Individual

By FRANZ ALEXANDER, M.D.
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At this conference it is not necessary to emphasize the tremendous practical importance of accidents in relation to our national economy. It is not surprising that medical men, psychiatrists, psychologists and statisticians have tried for a long time to establish precisely what is the human factor in the causation of accidents. Effective prevention requires such precise knowledge.

The contention of modern psychiatry that most accidents are not accidents at all but are caused largely by the victim's own disposition is but a confirmation of common observation. Strictly speaking, an accident is an occurrence, the cause of which is outside a person's control. A brick falling on a pedestrian's head is a completely accidental event, particularly if the pedestrian is not warned by a sign that such an event is likely to occur at a particular place.

Most industrial and traffic accidents, however, are of a different nature. The sufferer of the accident has some active part in its causation. It is popularly assumed that he was clumsy, tired, absent-minded; otherwise he might have avoided the accident.

Scientific scrutiny, however, has established that most accidents are not favored by such simple human qualities. Many scientific discoveries appear at the first moment unexpected and improbable. So is the fact that certain people are prone to have more accidents than others, not because they are clumsy or absent-minded, but because of the total structure of their personality. The significant factor is not a particular isolated feature such as slow reaction or lack of intelligence but something much more basic which pertains to the totality of the person as an individual. Let me first mention a few startling facts concerning the human factor in accidents.

More than twenty years ago, Marbe, a German psychologist, established the remarkable fact that the person who had one accident is more than likely to have another one than the person who had never suffered an accident. Statistical studies in large industrial companies have shown that accidents are not evenly distributed among the employees, that a very small percentage of employees has a very high percentage of the accidents.

One might conclude from this that possibly those employees who have more accidents are those whose assignments are most dangerous. That this is not so, however, is demonstrated by the fact that those persons who have the most accidents in one kind of job have also the most accidents in other

kinds of jobs. Moreover, those employees who have the worst accident records in their jobs have also the most frequent accidents at home or on the way to work.

One large company which employs a great number of truck drivers became concerned about the high cost of its automobile accidents and tried to analyze the causes of accidents in order to reduce the frequency Among other procedures, they examined the accident records of each driver, and finally they transferred those who had the most accidents to other occupations. By this simple device they succeeded in reducing the accident rate to one-fifth of its original level.

The most interesting fact in this study is that the drivers who had a high accident rate retained their accident habit in their new occupation. This shows irrefutably that there exists an accident prone person, and that accident prone individuals are accident prone in any occupation and in their everyday life.

After this highly significant fact had been esablished, the next problem was to determine those qualities in a person which make him inclined to have accidents.

It was discovered that the total personality structure was to be held responsible for the accident prone individual. Dunbar who, with the modern methods of psychiatry, studied a large number of fracture patients found that the accident prone person as follows: He is decisive or even impulsive; he concentrates upon immediate pleasures and gratifications. He is apt to act upon the spur of the moment He likes excitement and adventure, he does not like to plan and prepare for the future.

A large number of persons with accident habit have had a severe upbringing and have derived from this an unusual amount of resentment against persons in authority Briefly, they are men of action and not of planning, persons who do not contemplate much deliberation and hesitation between impulses and their actual execution. There may be various reasons for this impetuousness, but apparently rebellion against restrictions by authority and all forms of external coercion is its most common origin.

Planning and deliberation are potent factors which make one refrain from immediate rash action. The accident prone person is essentially a rebel. He cannot tolerate even self-discipline. He rebels not only against external authorities but against the rule of his own reason and self-control.

Intensive psychoanalytic study of a few cases has allowed an even deeper insight into the intricacies of the emotional life of the accident prone person. Particularly revealing were studies which scrutinized the emotional state of the person immediately before his accident. Dunbar, Menninger, Ackerman, Rawson and others have shown that in most accidents there is an element of intention, though this intention is by no means conscious.

In other words, most accidents are unconsciously intended. They belong to that category of phenomena which were described by Freud as the errors of everyday life such as misplacing an object, forgetting to mail a letter and carrying it for days in one's pocket, misspelling or mispronouncing a word. Freud showed convincingly that such errors are not accidental in the strict sense of the word but are unconsciously intended. When a president of parliament erroneously declared a meeting closed instead of opening it, he had some good but hidden reason for having the meeting over with before it started. A person who carries a letter in his pocket for days has some definite, although unconscious, reason for not mailing it. Most accidents are similarly caused by unconscious motivations although they usually are of much graver consequence than these more harmless errors of everyday life.

Psychoanalytic investigations have revealed the nature of the unconscious motives which induce people to act in a way which causes accidents. The most common motive is a sense of guilt which the victim tries to expiate by self-imposed suffering, by self-imposed punishment. The unconsciously intended accident serves this purpose. Since this may sound improbable to you, I shall try to illustrate it with a few brief examples. Ackerman quotes the following case:

> "A youth was driving his mother on a shopping tour. He begged her for the use of the car for a fishing party the following day. She refused, whereupon he fidgeted angrily, 'accidently' stepped on the accelerator and sent the car into a ditch, injuring both himself and his mother."

The combination of revenge and guilt was obvious in this case. This young man punished his mother, but at the same time he punished himself.

According to Rawson, 60 per cent of fractures studied psychiatrically confessed guilt and resentment in their relationship to some person in connection with the accident. He illustrated this by such revealing examples as the following:

> "A 16-year-old Puerto Rican said: 'It was really my fault because Mother said supper was ready, and I was not to go out. I went out anyway, got into a wrestling match and got my arm broken. Anyway, I guess Mother's sorry she's so strict with me.'
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> "A 27-year-old woman was hurt sliding down a banister. She had always worked off annoyances with her parents and later with her husband by such tricks. 'Perhaps I ought to know better, but I wouldn't have been like that if they had had more sense, and had treated me more like a person instead of being so strict.'
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> "A secretary fell and fractured her hip. 'I asked my friends why I must be punished so. I can't remember ever having done anything wrong, but I must have done something terrible'."

The basis of this strange combination of emotions is a deeply ingrained attitude prevalent in our present civilization, that suffering expiates guilt. If the child commits something wrong, he is punished. Through the suffering caused by the punishment he makes up for his guilt and thus deserves and regains the love of his parents. The same emotional attitude is at the base of our criminal procedure. The offender serves his punishment, after which he can return to the community as a free person who has expiated his wrongdoing. The human conscience applies this same procedure within the personality. The conscience acts as an internalized judge whom we carry in ourself, and who demands suffering for our wrongdoings. Suffering relieves the pangs of a guilty conscience and restores the inner peace.

The most common causes of guilt feelings in children are hostile, rebellious impulses against the parents. The accident prone person retains his childhood rebellion against persons in authority even in his later life. He also retains the guilt reactions originally felt towards his parents. The combination of these two, resentment and guilt, is the most common factor in accidents. Those people who have a great deal of this self-punitive urge constitute the majority of the accident prone individuals. The guilt feelings are convincingly revealed in the frequent question of the sufferer right after his accident; "Why did it happen to me? What did I do to deserve it?" These questions show that the guilt feeling, although not quite conscious, is vaguely sensed by the patient.



It was 20 years ago that I first became convinced of the unconsciously intended nature of certain accidents. I was consulted by a very intelligent man in middle life suffering from a severe depression which developed out of an unsuccessful struggle for existence. He came from a well-to-do socially eminent family but had married into a different social stratum. After this alliance his father and family refused to have anything more to do with him. His unsuccessful struggle for existence through many years terminated (on account of neurotically determined inhibitions) in a total psychic collapse.

I advised him to begin an analysis with a colleague, because I had personal relations with him and his family and was well acquainted with his previous history. He found decision difficult. One evening when the final decision about the analysis was to have been made, he asked to visit me in order to talk over the pros and cons once more. But he did not arrive; he had been run over by an auto in the neighborhood of my home. He was taken to a hospital suffering from many severe injuries.

It was only the following day that I heard of the accident. When I discovered him in the third-class division of the hospital, he was bandaged up like a mummy. He could not move and all one could see of his face were his eyes, shining with a euphoric light. He was in good spirits, free from the oppressive melancholy of recent days. The contrast between his physical condition and his mental state was striking. The first words with which he greeted me were, "Now I have paid for everything, now I will at last tell my father what I think of him." He wanted to dictate a determined letter to his father immediately, demanding his share of his mother's estate. He was full



of plans and was thinking of starting a new life.

What is most impressive in this story is the emotional relief which this patient gleaned from his injury. It freed him from the pressure of his guilty conscience which was stirred up by his extremely hostile feelings against his family who refused to recognize his marriage. After the injury he was ready to express freely all his resentment and tell his father what he thought of him.

Occasionally there are other unconscious motives at work in the causation of accidents such as the wish to avoid responsibility, the wish to be taken care of, even the desire for monetary compensation, but time does not allow me to go into further detail concerning these secondary motivations. There is also some evidence of a correlation between accident proneness and certain isolated faculties such as side vision which cannot be discussed here. Another interesting correlation is between accident proneness and low blood pressure. Since blood pressure is correlated with certain personality constellations, the significance of this finding will have to be elucidated by future studies.

In summary, the accident prone individual is an impetuous person who converts immediately into action his momentary impulses without deliberation and planning. He harbors a deeply ingrained rebellion against the early excessive regulations of his upbringing—a deep resentment against persons in authority. At the same time he has a strict conscience which makes him feel guilty for his rebellion. In the unconsciously provoked accident he expresses his resentment and revenge, at the same time atoning for his rebellion by his injury.

What can we learn from all this for the momentous practical problem we are interested in at this conference: the prevention of accidents.

Since the major factors in accidents are not external, such as defective machinery or unfavorable conditions like weather, darkness, etc. but lie in the person who has the accident, the primary measures must be directed towards the person. There are only two effective ways to approach this human factor: one is to change the individual and the other, to take the accident prone person away from those occupations where the danger is great. Both measures require reliable methods by which the accident prone individual can be spotted. Because the psychological factors which predispose an individual to accidents are not simple isolated qualities, they cannot be detected by the usual methods of psychological testing. The psychiatric interview, conducted by an expert, which reveals the whole previous life history of a person is the most, if not the only reliable method.

The accident habit develops early in life and manifests itself in the youngster, in a noticeable inclination to contract physical injuries even if only minor. Also, the combination of excessive resentment and guilt manifests itself in early childhood in various ways familiar to the trained psychiatrist.

To alter such an ingrained emotional pattern as is characteristic for the accident prone individual by psychotherapy is a major therapeutic task. It requires prolonged treatment and is, therefore, in the present state of psychiatric facilities, of no practical significance. The recognition of the accident prone person and his removal from occupations which are dangerous for him and for the public is at the present moment the only effective measure.

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# Accident Prevention—A State Health Department's Responsibility

By F. C. BEELMAN, M.D.
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There was a time when hazards to life were so great that the annual toll from accidents passed unnoticed. The ravages of uncontrollable disease brought fear and despair—not only to individuals and families but to large cities. Just a lifetime ago recurrent epidemics decimated the younger population groups in entire communities.



The compound microscope, with its oil emersion lens and the new world of bacteria, advanced medicine from its dark ages into a new era of scientific truths. Since the 1890's, in almost every state there have been constantly increasing efforts to avert preventable diseases and deaths. Public health and preventive medicine, the application of new medical skills, immunizing agents, and drugs, have changed the leading causes of death. In no group is this change more striking today than in the younger population. The first reliable mortality statistics for Kansas were tabulated in 1916, and by comparing causes of death in 1916 with those for 1947, a graphic story emerges concerning health progress in only 31 years. In 1916 there were 1,548 deaths from acute communicable diseases. In 1947 there were only 290 such deaths. For children of school age the mortality decrease is even more remarkable. In 1916—318 children between the ages of 5 to 19 died from acute communicable disease, as compared with only 20 in the year 1947.

There is one leading preventable cause of death and disability which has not kept pace with its mates of half a century ago—accidents. The estimated acute communicable disease rate, as mentioned for Kansas in 1916 for ages 5 to 19 was 61 per 100,000 population, as compared with the rate of 4 for the year 1947—a decrease of 93 per cent. The accidental death rate for the same years and the same ages was 40 for 1916, and 35 for 1947—a decrease of only 12 per cent.

Unfortunately, there are only meager statistics available indicating the status of accidents as a factor in non-fatal, temporary disability or crippling.

Death statistics, however, are complete and indicate clearly the current risk from accidental death as compared with all other causes. For Kansas, in 1947, accidents were the fourth leading cause of death for the total population, but for all ages, up to 35, they were the leading cause of death. Further analysis shows that for ages 5 to 19, accidents represent almost one-half of the total deaths. Specifically, 172 children in Kansas between the ages of 5 to 19 years were accidentally killed in 1947.

Favorable mortality trends for the first eight months of 1948 in Kansas were highlighted by the exceptionally low death rate from acute communicable diseases and the exceedingly high death rate from accidents. In eight months of this year, Kansas is near a record breaking accidental death rate. Both motor vehicle and other accidents are reaching nearly an all-time high for the State. If this trend is true for other states, 1948 may see a national record breaking year in the number of lives lost through accidents.

Accidents are, perhaps, the most preventable of all the misfortunes of mankind. People cannot be immunized against them. They must know how to avoid them. From the past available records it seems that some small progress may have been made in accident prevention. Yet, at the present rate, it will be many decades before accidents have undergone a decline comparable to the experience in the control of communicable diseases. Are state health departments, which, in the past, have initiated and put into operation programs that have contributed so much to the saving of lives through communicable disease control, fiddling like Nero while the accident death rate mounts—or, fully aware of the devastating scope of the accident problem? Are they convinced that nothing actually can be done about it?

To answer this question fairly, and without prejudice, a questionnaire was prepared and mailed to every state health officer. An excellent response was obtained. Forty-one —or 85½ per cent—completed and returned the questionnaire. Three state health officers replied that, in their departments, nothing was done toward accident prevention. All the others carried on accident prevention activities to some degree. The questions and information secured follow:

The first question asked was—"In what place do accidental deaths rank as a cause of death in your state?" In two states—Nevada and Idaho—they are the second cause of death; in nine states—Texas, Utah, Louisiana, Montana, New Mexico, California, Arizona, North Dakota, and Florida —they were the third cause of death; in nineteen states—the fourth cause of death; and in seven states—the fifth cause of death. One state each reported accidents as the sixth, seventh, and eighth cause of death. In 31 out of 41 states, 75 per cent, accidents ranked fourth, or better, as a cause of death.



The second question was—"To what extent should state health departments engage in accident prevention activities?" Ten state health officers replied that it should be a major activity; 27 stated it should be a minor activity; three did not commit themselves, and one stated it should not be a function of state health departments. Recognition of the responsibility of the state health department in the field of accident prevention is clearly indicated by the 25 per cent which felt it should be a major function, and the 66 per cent which indicated it should be a minor activity.

The next question, entirely in the realm of speculation, was—"In your opinion, what would a major accident prevention program in the state health department, operating on a divisional basis (comparable with tuberculosis control) accomplish in decreasing the accidental death rate for your state?"

5 state health officers replied that it could be reduced 25 per cent
12 state health officers replied that it could be reduced 15 per cent
9 state health officers replied that it could be reduced 10 per cent
6 state health officers replied that it could be reduced 5 per cent

9 state health officers gave no opinion. Even the reduction of 10 per cent, or more, which 64 per cent of health officers believe could be accomplished, would result in a greater saving of lives than in many other areas of intensive activity.

*The fourth question*—"*What is the* extent of your state health department's organization responsibility for accident prevention?" None of the states, at the present time, have a major division with full-time personnel engaged entirely in accident prevention activities. New York is the only state with a minor bureau with full-time personnel. Many of the states are carrying on some accident prevention work as a part of the activities of various state health department divisions.

Health Education Services ....31 states
Maternal and Child Health.....13 states
Industrial Hygiene.....29 states
Vital Statistics.....24 states
Division of Sanitation.....15 states
No activities..... 2 states

The fifth question was—"What type of accident prevention activities are carried on in your state health department?"

26 states carry on special statistical studies on accidents
6 states promote organization of local Safety Councils
4 states coordinate state-wide accident prevention activities
16 states furnish consultation services to other state departments on accident prevention
1 state *health department lends personnel* to other state departments
19 participate in State Safety Council activities
11 prepare and publish special reports on accidents
5 prepare and publish pamphlets
7 prepare and publish posters

*Under Safety Inspection Services*

18 states carry on safety inspection services in industry
11 states inspect public buildings for safety measures
7 states inspect mines for safety practices.

*Under Health Education Services*

27 states prepare and release newspaper articles
15 prepare radio releases
21 talks are given by personnel
27 distribute pamphlets on accident prevention
16 distribute posters
24 distribute films on safety.

It is evident that health department activities now concern themselves largely with *the study and educational aspects of accident* prevention. A few are entering on more specific control programs such as promotion, assisting in forming local safety councils, co-ordination and inspections. Sixty-six per cent of those replying are developing programs.

The sixth question concerned itself with personnel, and it is an important question—"Indicate the number of *health department* personnel engaged in accident prevention activities." Answers to this question were disappointing as the totals indicated relatively few persons are actually engaged in accident prevention programs in state health departments.

1 state—full-time employment..... 2
1 state—full-time employment..... 1
1 state—half-time employment..... 2
1 state—half-time employment..... 1
30 states—small amount of time.....170



The seventh question gave some indication as to the amount of money that was being spent for accident prevention programs—"What is the estimated amount of funds expended on accident prevention by your state health department?"

15 states indicated they were spending approximately $1,000 or less
4 states indicated they were spending approximately $2,000
1 state indicated it was spending approximately $3,000
2 states indicated they were spending approximately $5,000
1 state indicated it was spending approximately $8,000
2 states indicated they were spending approximately $10,000
12 states did not make a statement.

Answers to the sixth and seventh questions indicate that state health departments have not, as yet, seriously undertaken the task of accident prevention. Any state-wide program, to be effective, must have full-time trained personnel, with an adequate budget. In the control of tuberculosis, which kills approximately 60 per cent of the number lost through accidents, state health departments are spending over $10,000,000 and have a small army of trained personnel of, at least, 10,000. It would be decidedly interesting to see what might be accomplished if forces of that magnitude were available and functioning in the field of accident prevention.

In the eighth question an attempt was made to secure information from the health officers relative to organization and departments outside the health department that were active in the field of accident prevention.

24 states listed a State Safety Council
6 states had a Safety Commission
5 states had a Safety Committee
3 states had an Industrial Safety Commission
7 states had a Public Safety Department.

In 31 states the highway department carried on safety programs, and in 16 states the department of labor; 21 states mentioned the department of education; eight states listed the department of agriculture, and 17 states listed the office of the state fire marshal. Other state departments mentioned were: state police, commerce department, insurance department, and workman's compensation commission. In most states, one or more organizations were active in the field of accident prevention.

Twenty-five states had regular appropriations for safety to a state agency; 11 had no state appropriations, and six gave no answer. Twenty-eight states had full-time personnel, which totaled approximately 212 persons; *nine did not have full-time* personnel, and four gave no answer. One question was asked as to the limit of accident prevention activities by these various state agencies:

13 carried on programs to control all accidents
25 carried on only highway and traffic accident prevention programs
15 engaged in home accident prevention
15 included farm accident prevention
15 industrial accidents
14 school accident prevention
15 included fire prevention safety programs.

This brief review of information, secured within the last few weeks from forty-one state health officers, presents a fair picture of the accident prevention problem and the progress which is being made toward the development of effective accident control programs within state health departments. A number of conclusions can be drawn.

State health officers are aware of the seriousness of the accident problem and the majority feel that it is a responsibility of the official health agency. They further believe that control measures can reduce the death rate. In fact, 26, or 60 per cent of the questionnaires returned, indicate that accident prevention on a divisional basis comparable to *tuberculosis control would reduce* the accidental death rate 10 per cent or more. Yet, only 10 of these 26 health officers thought that accident prevention should be a major activity of the state health organization. The majority of state health departments, at the present time, are carrying on studies and limited educational programs in accident prevention. A number of states have expanded programs to include promotion and co-ordination of activities.

If the responses of the health executives of the United States are accepted only in part, it is clear that health departments are allocating grossly inadequate funds for accident prevention activities. Funds and per-



sonnel should be provided in sufficient quantities to construct active safety programs and to coordinate safety activities within the states.

State-wide accident prevention programs are still in the experimental and planning stage, as evidenced by various divisions within the state health department carrying on separate activities.

Many state departments are interested and active in accident prevention. Probably the most active, operating in a greater percentage of states, are programs of highway agencies aimed at motor vehicle and traffic accidents. Occupational accidents are possibly second in their coverage by state labor departments. Home and public accidents (other than motor vehicle) receive the least attention from state agencies and might logically be the entering field for state health departments.

There is, apparently, no uniform well-organized agency, either official or voluntary, with full-time personnel and funds actively covering the broad field of accident prevention. Many states have funds appropriated for various phases of accident prevention. No specific federal funds, or national voluntary agency funds, appear to be available to states for demonstrations, program planning, or the training of personnel in the field of accident prevention.

These conclusions might be compared to the conclusions drawn by the Sub-committee on Accident Prevention of the American Public Health Association and published in the March, 1945 JOURNAL of the American Public Health Association. The article entitled, "Accident Prevention—An Essential Public Health Service" resulted from a study in which some three hundred state, county and local health departments were asked to outline their past and current accident prevention activities. Conclusions reached were as follows:

"1. Health departments on the whole are now doing very little as regards actual or contemplated studies in the home accident field.

"2. Some casual educational work is being undertaken, generally in cooperation with other agencies and frequently through nursing staffs.

"3. There is considerable awareness of the importance of the field and the logic of health department participation in it. There is also evidence of a desire for suggestions and information which health departments can utilize in connection with integrating safety with health educational activities."

It is evident that progress is slowly being made by state health departments in assuming responsibilities in the accident prevention field. The increasing seriousness of the problem warrants greater effort on the part of all interested state and national organizations. Only through organized and coordinated activities embracing the concerted action of official and nonofficial organizations can we hope to curb this needless loss of life.

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# "Built-in" Safety in the Home

By TYLER S. ROGERS
Owens-Corning Fiberglas Corp., Toledo, Ohio

When someone falls on a steep stairway at home, part of the blame for the accident should rest on the man who designed the stairway.

When someone falls on an ice-covered doorway or terrace, part of the blame should rest on the man who failed to provide an overhead shelter that would keep out the ice.

When Fibber McGee gets banged on the head by the contents of an over-stuffed closet, part of the blame—but only a small part—should rest on the designer or builder who didn't provide enough storage space in the McGee home.

The accident prevention phase of home safety is partly a matter of original design. It is this part of the safety problem with which I shall deal.

If we take the records of home accidents and sort out those which are due to improper design from those which are due to human factors of carelessness, ignorance, foolhardiness and the like, we find a relatively small list of causes. But this list is important, for it is a contributory cause of thousands of injuries. And it is important because it contains elements that should not be perpetuated by repeated use in the million new homes the building industry is erecting each year!



Here are the major items on the list:

1. *Interior stairways:* too steep, badly proportioned steps, curving winders, lack of handrails, lack of head room, inadequate lighting, slippery or uneven treads. It would be nice if everyone could live in one-story houses without basements or attics; that would eliminate stairways altogether, but then we would not know how to handle ourselves when we had to visit some school or office building that did have stairs.

2. *Outside walks and steps:* subject to the same troubles as indoor stairs plus the hazards of ice and snow and rain. Terraces and entrance porches are included here.

3. *Unsafe floors:* uneven, slippery, or sloping floors, high thresholds or changes of level due to changes of surfacing. We cannot blame loose scatter rugs on designers, nor the degree of slipperiness due to polishing, even though they are major hazards.

4. *Cupboard and cabinet doors* that swing out where they can be bumped into by the busy housewife. Included here are improperly designed doors on refrigerators, ranges, clothes- and dish-washers, laundering devices, etc.

5. *Closets and their fittings:* inadequate in size, containing shelves above safe reach, with projecting fittings that cause bumps in the dark. To be sure, most people abuse the closets they have; the art of disposing of useless junk is not well developed.

6. *Doors that swing the wrong way.* They are often blamed for black eyes they didn't cause; but on the other hand, the skeptics are often wrong.

7. *Poor traffic arrangements:* the enforced use of living rooms, dining rooms and kitchens as traffic ways. Hallways are very desirable for traffic, but other rooms have furniture that causes accidents in the dark, or clashes between running children and busy adults.

8. *Inadequate lighting:* not only in halls and passageways, but on stairs, in closets and in rooms that must be used for traffic. The ability to pass through the house, turning lights on ahead and off as you leave is a minimum safeguard when rooms serve as necessary passages.

9. *Safety from fire,* involving not only proper design and construction and the use of low-hazard materials, but provision for rapid and safe exit from any part of the house if fire should start.

10. *Safety in the use of electricity, gas, oil and coal fuels* and proper protection of boilers, water tanks, refrigerators and similar domestic appliances.

These last two, you will note, are the only items on the list that are well covered by universally recognized building codes and ordinances. In ratio to their potential danger, they are probably the cause of the fewest accidents. That is due, I believe, to the fact that everyone recognizes the imminence of high personal danger in these sources of power and in the hazards of fire; hence they respect the codes and support their enforcement.

Stairs and stairways are also within the province of most building codes. Nevertheless, statistical evidence of home accidents points sharply to the question of the adequacy of code provisions or to the degree of their enforcement. I have seen too many houses being built today that have obviously hazardous stairways to believe that the code requirements are adequate, or that the sound codes are being enforced. The pressure of cost is making small houses smaller; the stairs are being squeezed down, inch by inch, to make space for other rooms. We are, I fear, building broken legs and arms, necks and heads, into altogether too many new houses.

What can be done to prevent these "built-in" accidents?

The job is big. There are many people concerned. And a good share of the work rests on us who have an acknowledged interest in home safety.

The designer comes first. The term "designer" may mean a professional architect or it may mean any builder or owner who draws the plans from which the house is built. The professional architect is least likely to plan without a conscious thought



for safety. It is part of the training of the experienced architect—although there are altogether too many young practitioners and complacent oldsters who can be swayed from good design by the demands of clients who insist on details that are unsafe in daily use.

It is more important to reach the amateur designer and the builder who plans more with an eye to low cost or high profit than to the living safety of the houses he creates. Only stricter codes, vigorously enforced, can reach these people and force the adoption of safe design practices.

Quite a measure of responsibility attaches to the owner for whom the designer or architect plans the house. Some of them are entranced with the narrow, steep, winding staircases found in many old center-chimney salt-box or Cape Cod houses of colonial days. Others want a winding, gracefully curved staircase reminiscent of the grand manor houses they have seen in the movies—but they don't have the space to make them reasonably safe. Others, imbued with the modern trend, will take freak stairways that resemble ships companionways, modified ladders, slippery ramps or almost anything that is not like an orthodox safe stairway. And these owners are largely responsible for improperly designed closets, cupboards, outside walks, steps and terraces and for poor traffic arrangements.

Builders, millwork companies, manufacturers of prefabricated cabinets, ranges, refrigerators and similar appliances, the producers of some types of floor finishes, all must accept some share of the responsibility for home accidents whenever their products are so designed that they can be hazardous in service. It isn't enough merely to require these products be safe when properly used; we should insist that they be designed so that they cannot become hazardous even when improperly used. That is a tough attitude to take, but I cannot absolve a manufacturer of building items, or a builder who uses them, unless they have taken every possible step to make their products foolproof, and show clearly how their products should be installed for maximum safety.

But we who profess an interest in home safety also must accept some of the responsibility. Our statistics show us the magnitude of home accidents and fairly well define their causes. We know that a great many accidents are built-in to modern homes. We know how they can be eliminated. It seems to me we have a job to do that has not yet been done.

When Mr. Fansler wrote me about this talk, he made some very keen observations. "The architect can design and the builder can fabricate a mechanically fool-proof home," he said. "But could the average person afford to pay for it? However, granted a fool-proof environment, there still remains the problem of fool-proofing the people, who live in such an environment—which is, essentially, an educational problem."

To my mind, we have not made adequate progress *in this necessary educational process.*

First, we should define far more clearly the good design practices that will eliminate the most common built-in hazards. We should give specific dimensions, tolerances, clearances, approved details where necessary. We should set up specific minimum criteria based on currently available accident statistics and modify them later on as further knowledge is gained.

Second, we should publish a "home-safety code" as a pattern for progressive communities that want to write these principles and criteria into their local regulations. And we should make this suggested code available to architects, builders and all other designers through the professional, trade and consumer publications that reach them.

Third, we should encourage the development of local counselling services to home builders and home owners.

Fourth, we should encourage local safety groups to analyze their existing building regulations in the light of our proposed home-safety code, to determine what deviations can be corrected.

Fifth, we should encourage study of the enforcement of existing code provisions to assure better compliance, both in new houses and in all existing residential structures.

And finally, through local displays and exhibits, we should demonstrate to all home owners the most common home hazards and practical means of eliminating them.

To my mind, such a program is our responsibility. We cannot prevent people from doing foolish things that cause accidents. But we can go a long way toward seeing that they do not, through ignorance or indifference, build accidents into their dwellings.



# Safety Is a Family's Business

By MRS. MARTHA LOU GUNDELACH
District Secretary, Southwest District Office, Family Service Bureau, United Charities of Chicago

How important is safety to you? I mean, how really important? If you were young George whom our agency met two years ago, then you'd know that safety is precious. You see, George is now 14—a very self-conscious adolescent. He's sensitive about his appearance—he feels ugly—he feels people don't like him. George *is* a lonely youngster and he's carried these attitudes with him as long as he can remember.

George has gone through life this way because safety was not assured. When he was eight months old he rolled off the bed and fell against the radiator. He received a third degree burn of the right cheek and left hand. The wound healed and left a disfiguring scar on his face. The family did not see the need for the plastic surgery and expensive treatments that were advised to correct this. They hoped the boy would outgrow the scar—instead he has an additional scar—his whole outlook on life has been scarred. The Family Service Bureau is now trying to help George correct his inner scars, but the recognition of the importance of safety could have done a preventive job.

The recognition of the importance of safety is very necessary. The plant foreman at the steel mills felt it keenly as he thought of Mr. Timothy who used to work on the forge. Mr. Timothy had enjoyed this heavy work for years. He had come to the steel mills as a young fellow. He was a handsome, dynamic young man, full of the zest of living and very proud indeed of his physical strength. No job seemed too much for him to perform, and for several years he maintained an excellent work record.

But as the plant foreman now reflected, he knew he would give anything in the world if he had insisted that Mr. Timothy take the precaution of playing safe and getting someone to help him on that *last job* that he had attempted. That last job was responsible for Mr. Timothy getting a double hernia.

True enough, the company and everyone had tried to make up to Mr. Timothy. He received his compensation and excellent medical care and was offered a job that he could do—that of sweeping floors. Everyone was aware of the seriousness of his physical injury, but no one had considered that every physical injury has its accompanying injury of attitude.

Mr. Timothy, the steel worker—the man envied by his buddies for his physical strength—now a floor sweeper. How did they dare offer him such a job—why he could never face his buddies—it was downright degrading and a constant reminder of the loss of his vitality. His wife was even stronger than he was now. That was a bitter thorn in his side, and it made him very irritable. Mr. Timothy was suffering not only from a physical injury but was also suffering from the loss of his self-esteem. It was in this frame of mind that he wandered into the office of the Family Service Bureau. Mr. Timothy needed some help to make the adjustment with which he was faced, and it was this kind of help that the Family Service Bureau was prepared to give.

We are beginning to see that this job of safety involves many things, and that the broadest of understanding as to causes and results can in many instances eradicate accidents and in many others can re-establish a sense of safety. The Family Service Bureau often becomes acquainted with families as a result of accidents which have disrupted family life and have caused severe suffering.

Chaotic social conditions increase the possibility for accidents. Very often accidents cause dislocations in family living and result in tensions that disrupt the family unit. I think of Mr. Mack, a discharged war veteran, who was faced with the impossibility of finding adequate housing for his wife and baby because of the acute housing shortage. Mr. Mack cherished his family and he wanted a home of his own. The only thing he could find was a garage.

It was just about impossible to heat this garage in zero weather and one bitter cold night while her husband was away working, Mrs. Mack got desperate. She couldn't bear to see her little boy so uncomfortable with

cold. She decided that she might make the coal burn better if she poured kerosene over it, and this she did.

Mrs. Mack's parents had neglected a very important part of her safety education. They had never stressed the danger of pouring kerosene over live coals, and as a result of this she suffered a terrible tragedy. Her clothing became ignited and she suffered such severe burns over her entire body that the doctor said it was a miracle that she lived.

Doctor and hospital bills were tremendous and impossible for Mr. Mack to meet on his earnings as a mechanic. Even after Mrs. Mack left the hospital, she had to have months of convalescent care and the couple were forced to move in with in-laws. Overcrowded living, the responsibility for a convalescent and for the Macks' young baby put a considerable burden on everyone. Moreover, Mrs. Mack's parents held a deep resentment toward their son-in-law, as they blamed him for their daughter's plight. He should have provided better for her.

These burdens were just too much, and, as a result, family tensions developed. This tension retarded Mrs. Mack's recovery. The baby was affected by all of the confusion and when Mrs. Mack was able to again be a mother to her own child, she was worried and hurt by his shy responses to her. As you can imagine, Mr. Mack had more than his share of worry and debts. There was no place to live that he could call a home of his own, and, on top of this, he bore the brunt of the resentment of his in-laws because of the disruption in *their* home.

This accident meant an illness of over a year for Mrs. Mack with the family's home life completely disrupted. It is difficult to estimate the damage done to this family group. The Family Service Bureau did help dilute the intensity of the suffering of the Mack family for we were able to help Mr. Mack work out some settlement on his debts. The agency through a trained case worker was able to permit Mr. Mack to give vent to his feelings of frustration and loneliness so that he was able to keep a better hold on himself and not give in completely to his worries. Finally he was able to coral his strength and begin to rebuild his family life and look toward the future.

Accidents cause inevitable physical suffering and family disruptions. The few examples I have cited could be multiplied many thousands of times. The price of accidents is human suffering.

Accident prevention requires many types of effort. The National Safety Council is doing a job by educating us all in the causes of accidents and what can be done to prevent them. We can all enumerate many reasons for accidents. We know that sometimes it is ignorance of possible dangers—sometimes, carelessness and sometimes, unresolved social conditions such as unsafe housing. Again, the cause of an accident may lie in the fact that a person is absorbed in worry. In addition to these more familiar causes for accidents, I would like to very briefly touch on one cause to which we have given very little attention until recently.

The story of Mr. Gale will make this point more clear. Mr. Gale sought help from the Family Service Bureau on three occasions. Each time the circumstances that brought him in was a need for temporary financial assistance, while he was awaiting compensation for an injury. Each time he had injured himself to the extent that he could not work.

On the first occasion that Mr. Gale came to the Family Service Bureau, he had injured his arm while working on a truck. This accident occurred a couple of months following the birth of his first child, and he was especially worried about his son's welfare.

The second time Mr. Gale came to the Family Service Bureau occurred about three years later. Amazingly enough, the circumstances were almost identical to those under which we first became acquainted with him. His second child had just been born and Mr. Gale was very worried about how his family could manage since he again was awaiting compensation for an injury that had just taken place. He had been employed by the Good Humor Company and his bicycle had run into a hole. He had been thrown and had hurt the arm that had previously been injured.

Three years later Mr. Gale again came to Family Service Bureau for temporary help. This time he had suffered an injury to his shoulder. He had accidentally knocked over some heavy boxes on himself when he was rummaging in his basement for



stored clothing. This accident occurred at a time when he was faced with additional home responsibilities in that his wife was ill and needed expensive medical care.

As you have probably noticed there are some striking similarities in the circumstances surrounding Mr. Gale's three accidents. Each time he suffers an injury this follows circumstances that have meant additional responsibility for Mr. Gale. His first and second accidents occurred shortly after the birth of his children. The third accident occurred at a time when his wife needed medical care, and the burden for the home was placed on him.

A *knowledge* of Mr. Gale's life experience gives some clue as to his behavior and explains the coincidence of his accidents and increased responsibilities. You see, Mr. Gale had been left to "grow up like Topsy." From a very early age, just when he most needed some one to depend on and guide him, a little brother was born who became the "apple of his parents' eyes." Mr. Gale was neglected and forlorn.

You can appreciate that a little fellow left in this sort of a spot would have a lot of angry feelings at being so deserted. Also, he'd naturally be guilty about his angry feelings toward his parents. As a little fellow, he did get attention, however, when he hurt himself. He didn't have to take so much responsibility for himself at those times, and he really did suffer when he had an accident and somehow that suffering took care of some of the bad conscience he had when he became angry about not being given attention.

Mr. Gale grew into an adult man ill prepared to meet the demands of an adult world. A piling up of responsibilities stirred up earlier feelings that had never been comfortably worked out. His feelings of frustration, anger and guilt piled up and he was "ripe" for an accident. Having an accident was the one way he had found to give him an out from these feelings. Of course, Mr. Gale was not aware of this explanation for his behavior. It was quite an unconscious pattern and one over which he had no control. He could only gain control over his behavior, if he were helped to understand the causes for his actions.

I'd like to cite one striking example from Dr. Dunbar's book, "Mind and Body," that re-emphasizes the importance of this aspect of the problem. In Chapter VIII, Dr. Dunbar tells of a large public utility company which operated a fleet of trucks. The company had cause for serious alarm as they noted that the accident rate of their employees was interfering in the profitable operations of their business. They went to great lengths to test their employees, to put in an intensive educational program for safety and to impose severe penalties on employees who had accidents. They shifted truck drivers who had frequent accidents to other jobs. Careful study showed that many men who had been shifted went right on getting themselves injured.

This example *illustrates* very well the point that the person who has the "accident habit" needs more to correct the situation than a manipulation of his circumstances of safety education. Dr. Dunbar makes this understandable through many individual histories that illustrate the way in which one's emotions can affect the personality that leads to the "accident habit." In such instances the individual needs help with his emotional problems.

The responsibility for safety belongs to each and everyone of us. Individually, we can make important contributions by taking the proper precautions in our own homes. Don't risk putting a box on a chair to stand on when you are in a hurry to hang that shade. If you're tempted to hasten the fire in your stove remember the story of Mrs. Mack. Safety begins at home and that's where our children will begin to get the idea of its importance.

Parents in the home, the policeman on the street, the teacher in the school and the foreman in the plant contribute individually by being sure that safety measures are enforced. If the plant foreman had insisted that Mr. Timothy not take the additional risk on his job, a *life-long tragedy would* have been averted.

The responsibility for safety belongs to us collectively, and as a community we make important contributions by supporting necessary institutions for our protection and safety. We are glad to support the fire department and the safety division of the police department. In the past year, the citizens of Chicago have crusaded for adequate ambulance service. At the present moment, we are pressing for safer and more adequate



housing so that people like the Macks will not be forced to live in unheated garages.

We, as citizens, support the National Safety Council out of our recognition of the importance of a co-ordinating agency in the community. We realize the worth of the very fine educational program of the National Safety Council.

We as citizens realize the worth and fundamental value of safe and happy living, and we contribute to the promotion and protection of families in many ways. Realizing that safe and happy family living depends on the security of employment; the security of a home to live in; the security of a safe community; we work together toward these goals.

When the security of our environment is threatened in any way the family suffers. It is in this area that the family service agency makes its contribution. Family strains, tensions and disturbed personal relationships become acute if safety in all its meanings is not protected. The Family Service Bureau is making a contribution by being at hand to aid the Georges, the Macks, the Mr. Timothys and the Mr. Gales in re-establishing their sense of safety and thus strengthening the security of the family. But more than that, the Family Service Bureau is on hand to do a preventive job, to help families ease their tensions and worries before a disaster occurs. Would it not have been more beneficial for Mr. Gale had he been helped to ease his feelings about his responsibilities rather than solving them through developing the "accident habit."

You, who have worked with local safety councils have become very familiar with ways in which you can most effectively work with industry in relation to safety. We would like to ask that you get acquainted in your own communities with another community channel through which you may broaden your program. I am referring to the council of social agencies. Most communities have such a council with which the social agencies affiliate for the purpose of considering community needs and community resources. The council is, therefore, in a position to make use of this broad understanding of the community and to work out a program that will help to strengthen and enforce safety measures.

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**As presented in the School and College Sessions of the 1948 National Safety Congress**


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# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety leaders throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to key individuals at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE SCHOOL AND COLLEGE DIVISION

This volume is a record of the sessions held at the 1948 National Safety Congress by the School and College Division. The conduct of these Congress sessions each year is only one of the many co-operative activities which the School and College Division carries on in behalf of its members, and for the benefit of accident prevention work in the field of education generally. The Division gives guidance in the preparation of a great variety of educational material useful in day-to-day school safety programs. The activities of the Division are under the direction of the School and College Conference. The officers of the Conference are listed on page 87 of this volume.

# Conservation of Life—A Challenge to Education

By J. P. SEIBERLING
President, Seiberling Rubber Co., Akron, Ohio

If Dr. Gallup were to take a poll to determine what the phrase "conservation of life" suggested, I surmise that most persons would think first of some form of conservation of wildlife. In my lifetime, at least, wildlife conservation has had far more publicity than humanlife conservation.

I would guess that the phrase "conservation of life" would mean to the second largest group responding to Dr. Gallup—conservation of plant life.

It may seem anomalous, but I would surmise that "conservation of life" would mean to the smallest group in this imaginary poll—conservation of *human* life. Why would I so estimate? Simply because the age-old rule that "what is everybody's business is nobody's business" has produced inertia in developing general concern for the extension and protection of human life. Then, too, there is that strange trait in human nature that keeps one from identifying one's life with others. We read in the daily papers of thousands of Chinese drowned in floods, Indians starved, Japanese killed by earthquakes, and so on, and turn over the pages casually to sports and the funnies. After all, we're not Chinese, Indians or Japanese, and their life problems are not ours—so what! Generally it is not until the insecurity of life in the form of disaster, epidemics, or accidents strikes close to us that we develop an acute life awareness.

For centuries medical science has progressed steadily in lengthening the average span of human life. But it was not until the National Safety Council was organized more than three decades ago that real progress was made in the conservation of human life by means of accident prevention.

Nowhere does a brighter prospect for accomplishment present itself than in the schools. Sentimentally and practically, conservation of *young* human life possesses broad appeal and manifest possibilities. When life is ended in the early years of its development there is a much greater and more poignant sense of loss than if it is cut off in its mature stage. The reason, of course, is that young life is largely prospect, whereas mature life is largely retrospect.

The possibilities of prospect are unknown—and therefore hopeful and exciting, but when it is ended one is ever haunted with the thought that maybe some great, good, wise, constructive life has come to an untimely end. Nature herself has always thrown about young life the safeguards of parental protection and maternal devotion, save only in life of the lowest order. Thus, conservation of young life possesses powerful appeal to the instincts, emotions and minds of parents far beyond that of any other age group, and the appeals are for the most part capable of universal understanding and comprehension in every type of home—whether hovel or mansion.

Secondly, while youth is famous for brash and foolish error, it is equally famous for its pliability and quickness of learning. The careless habits of a mature life are difficult, if not impossible, to change. Young persons are capable of being taught and trained to improve the error of their ways, notwithstanding the careless faults and habits of their elders. Thus, practical reasons dictate the wisdom of pursuing, with enthusiasm and reasonable expectancy of great accomplishment, the conservation of young *human life*.

But how are our young people today going to learn to live, particularly in these fast-moving, highly complicated, rapidly changing times? There are chiefly three ways that I can think of:

*First*—In the school of experience—by the well-known trial and error method. This school and method generally insure lessons well taught but student fatality is usually exceedingly high.

*Second*—In home training. This is very effective where there is a real home, and the training is intelligent and conscientiously and continuously given. This combination unfortunately is the exception rather than the rule.

*Third*—In the classrooms of our schools and colleges—where our young people spend the largest portion of their day-time hours for nine months a year and where safety training can be standardized, suited to age and sex, and continuously given.

Because of the shortcomings found in the first two alternatives, it may well be asked—



"Where else but in our schools is the task of safety education to be thoroughly and effectively accomplished?"

When one considers that accidents are now the chief cause of death among young people, and that in 1947, according to data compiled from schools reporting to the National Safety Council, 54.5 per cent of student accidents occurred in school buildings, on school grounds, or going to or from school, one can scarcely escape the conviction that educating youth *how to live* should be reasonably associated with the formal education of youth.

What is needed is a complete, integrated, sustained program of safety education beginning in kindergarten and continuing throughout the student's educational experience. Then a degree of safety consciousness will be established that should lower the accident death rate to insignificant proportions, and all but a very few of the 27,000 now killed yearly in the 1-to-24-year age group will have the opportunity to experience a full life.

The most serious obstacle to the development of such a program is the attitude, strange to say, of many parents who feel that instilling caution inspires fear. Such persons believe fearlessness is synonymous with courage, and fearfulness with cowardice.

But fear is not the enemy, but the friend and protector of man. Fear arises from the natural instinct of self-preservation. Furthermore, fear is not the product of caution. Without fear, courage would be nonexistent. Cowardice is the product not of fear—but of unreasoned fear. But *unreasoned* fear is as different from *reasoned* fear as right is from wrong.

This summer while traveling thru Canada, I observed a sign which read, "*Eviter les dangers de feu*"—avoid the dangers of fire. It did not say avoid fire, because obviously properly controlled fire is one of man's greatest benefactors. The injunction was to avoid the *dangers*. I have thought about that simple sign many times since then—and have been impressed with the wisdom it contains as a guide to life.

One remembers only too well the tragic case of the famous McLean child in Washington, whose parents were so concerned for his safety that they kept him guarded night and day. *Unfortunately they overlooked* the greatest safeguard of all—knowledge of danger and how to deal with it. The child, one day rebelling at his constant supervision or possibly just seeking adventure, broke away from his personal guard and, ignorant of the danger involved, dashed across the traffic-laden street to be struck and killed. Ignorance is never bliss when danger is concerned.

One remembers also the case of the youth who, wanting to show his playmates how *fearless* he was in handling explosives, poured a couple of drops of nitroglycerine on an anvil, struck the spot with a hammer, and immediately blew off his arm and blinded himself for life.

We must be sure young people know the dangers—the dangers of automobiles, bicycles, loaded firearms, sharp tools and instruments, darkness, blinding lights, poisons, explosives, fire, blizzards, ladders, heights, tides, enticing waters, electricity, and countless other entrapments of nature and dangerous instrumentalities of man. Then we must be sure they know how to *avoid* these dangers.

With such knowledge, *youth* with all its high spirit, eagerness, enthusiasm, aspiration and untold possibilities for good—having learned to live—can look forward with reasonable expectancy to a full life of worth-while accomplishment.

By means of such education, the appalling economic *waste* occasioned by the present yearly accidental loss of young lives, and the deep heartache and bitter sorrow experienced each year because of such loss *can be virtually eliminated*.

# Meeting the Challenge to Safety—By the State

By A. R. MEADOWS
State Superintendent of Education, Montgomery, Ala.

Ignorance, immorality and callousness are the greatest enemies of mankind. Either single condition or trait in an individual can jeopardize his own safety or the safety of others. A combination of any two of the traits in an individual is doubly hazardous to his neighbors.

A New England farmer heard that the

explosion of atomic bombs in Japan had enriched the land. His soil was poor, so he wrote to the Atomic commission about what he had heard and requested that an *atomic bomb be dropped on his farm*, provided the commission would give him 24 hours' advance notice and would not tell his neighbors about the bomb. Of course, we know that the farmer was either ignorant, immoral, callous, or all three. In any case, he was hazardous to his neighbors.

The hazard of ignorance to its possessor is reasonably self-explanatory, but the necessity for eradicating ignorance in its possessor, for the safety of others, is not fully appreciated.

Immorality is not so self-explanatory, but we have examples of it in drunkenness on the highways, in the home and on the job. Throughout the world, atomic and bacteriological weapons of war threaten to destroy mankind. Unless moral man can prevail over scientific man, there can be no *safety in the world.*

Callous man does not care what happens to his fellowman. He will not try to improve the safety of others. The usual meaning of the word accident tends to promote a psychology of callousness. Most so-called accidents are not accidents, but human errors. The word accident tends to excuse the person who caused the mishap. In too many cases, the so-called fatal accident is unintentional murder. I know of such cases and you probably do also.

It is not enough to inform mankind about the hazards of life and the ways to avoid them. The will to follow the road to safety must be developed and cultivated if we are to be safe in this mechanized age.

The best way for the state to meet the challenge to safety is through education for *safety. Such education must deal with* moral responsibility, as well as intellectual competence. The Northwest ordinance gave the fundamental principles of safety education and all other education in the declaration, "Religion, morality, and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged." Those principles are equally sound today. It is generally accepted that we are farther advanced scientifically than we are socially. We know far more safety than we practice.

Education can assist in meeting the safety needs of students by having safety education as a part of the core of the curriculum in the public schools and in teacher education. If such education is to be effective, *moral responsibility for safety must be developed.* Some of the activities through which safety can be practiced as a learning experience include the following:

1. Safety inside and outside the school building in all pupil activities at school
2. Safety in the home through home economics courses and projects.
3. Safety on the farm through vocational agricultural courses and farm projects.
4. Safety on the job through on-the-job training and occupational studies.
5. Safety on the streets in walking to and from school.
6. Safety on the highways through driver training programs.
7. Safety in school transportation wherever pupils ride to and from school.
8. Safety through observation in field trips.

Other suggested ways in which the state can help meet the challenge to safety include the following:

1. State safety standards for constructing school buildings and for maintaining buildings and grounds. (Much has been done in this field.)
2. State standards for the construction of school buses. (Great progress has been made in this field in recent years.)
3. Safety standards in school transportation operation. (Much of this must be through education and some excellent programs are in operation.)
4. State safety committees that will encourage the development and functioning of community safety committees.
5. State building codes for safety. Too often such codes are so inflexible that *they block desirable improvements* through the use of new materials and new methods of using materials, and even more often include regulations to benefit special interest groups without *adding* to safety.
6. State motor vehicle codes.
7. State traffic laws.
8. State programs to remove traffic hazards.

In closing, I want to emphasize a long established principle that legislation and regulations have little influence without intelligent moral support by the people they are to serve.



# Meeting the Challenge—For the Larger Cities

By D. WILLARD ZAHN
District Superintendent; Chairman, Committee on Safety Education, Philadelphia Public Schools

Public support and public approval is a must for "life-saving" education.

A driver training program must sell itself in terms of ideals, standards, and above all saving life and preventing property damage.

A health examination program must pay for itself in improved health, demonstrated statistically.

A safety program must not develop improper or undue fear: it must not put a brake on action.

A sports program must include exceptional care for the injured as well as elimination of foreseeable and undesirable accidents.

In a large city, the problem is difficult because we deal on an indirect, impersonal, faraway basis: in the small communities there is greater opportunity for the development of understanding.

The primary and most difficult task in safety education is essentially the same as in all education—the translation of *standards into practice*, codes into conduct, talk into technique, passive verbalism into participation, discussion into action, plans on paper into achieved results, good wishes into desirable acts, isolated group planning into co-ordinated community action, individual thought into shared responsibility.

I am not unaware that planning, talk, codes and standards are important. They are—but only as a means to the desirable end of improved practices.

Participation is activity is fundamental. Without participation education is left in an academic vacuum.

Large cities have a peculiar capacity for excellent plans and poor implementation, for glorious pamphlets and poor portfolio; for extended standards and limited practice. Of course, there are obvious reasons inherent in city structure, area, complexity, politics, self-glorification. But there are also unlimited and, to a large degree, unrealized, potentialities. The big thing for big cities to do is to put responsibility on neighborhoods and offer them the means for developing initiative. In education for conservation, *this means putting more* responsibility on school staffs as autonomous units and granting them means and power to solve their own problems. To the extent that this is done, meaningful participation will be assured. Ultimately, this attitude must filter to the small group, where final action takes place or where indifference otherwise resides.

*Standards of Evaluation*—Life preserving practices must be measured at the local level—the neighborhood. Efficiency of conservation efforts must be measured ultimately in terms of:

A. Actual decrease in the incidence of existing destructive forces and the substitution of constructive aids to happy and satisfying living in each neighborhood, and.

B. In the development of attitudes reflecting participating civic action by groups and individuals. This may seem to be difficult. Take the local school *safety program as an example.* Recognizing that sharp definition is not intended, five levels of improving achievement have seemed to represent the average developmental situation, through which city schools have either hurried or dawdled in their development, viz.—

*Level 1*—The school possesses just a patrol and the activities incident to the patrol: induction ceremonies, awards, patrol activity and the accompanying school stimulation.

*Level 2*—In addition to (1) classrooms are encouraged to indulge in a variety of safety activities.

*Level 3*—In addition to the above, definite safety content has been outlined: classes are expected to achieve understanding of safety content at their class level.

*Level 4*—In addition to the above, safety groups within the school make participation a fact on the part of an

increasing number of students and staff, both for the school as a whole, and within classrooms. At this stage safety councils, courts, clubs, safety reports and research appear.

*Level 5*—Finally, in addition to the above, there is a co-ordinated school-community approach to safety. Adults, the community councils, the police and welfare agencies take part in planning the program and they all participate to some degree in executing it. The whole community participates.

There are, thus, elements common to the educational picture which exist in all cities and towns, regardless of size.

## Meeting the Challenge in the Medium-Sized City

By LONNIE GILLILAND
Coordinator of Safety Education, Public Schools, Oklahoma City

Perhaps, at the beginning we should take a look at the accident picture as it was in the medium-sized city in our country during the past year. Last year for the average city which reported, there were 69 fatal accidents—54.5 fatalities per 100,000 population. These may be broken down as follows: motor vehicle—19, public non-motor vehicle—12, home—33, and occupational—6.

Accidents in 1947 killed more people in the 1-to-35-year age bracket than any disease. This year and next, unless you and I do something about it, one out of every three children that die will die as a result of an accident.

Let us ask ourselves the question—what is it that is causing these accidents? Ninety-eight per cent of them happen because of some failure, human or mechanical. Twelve per cent of them can be attributed to a mechanical failure, eighty-six per cent are due to some human failure, human inefficiencies. Only two per cent of all accidents are chargeable to the Deity. In view of the facts just stated, would we not agree that the job we have before us is to correct these human inefficiencies.

To meet the challenge which we have before us in the medium-sized city, may I suggest a four-fold procedure? One, determine the needs of our pupils in their whole environment. Two, plan a program to meet these needs. Three, put the plan into action. And four, evaluate the program periodically to see if the objectives are being attained.

By determining the needs of boys and girls in their present environment and in many cases their future environment, we will be able to guide them in the correct solution of many of their problems. We must be mindful of the fact that if a youngster arrives at or makes the wrong decision on one of the busy streets of our city, he may not live to have the opportunity of trying again. If it were an arithmetic problem that he missed, his teacher no doubt would allow him the second attempt. Youngsters must be helped to solve safety problems correctly under all conditions and circumstances.

You may ask and rightly so, how can one determine the needs of youngsters in the community? There are many tried and proven methods employed to secure this information. I shall mention only a few which we have found to be quite helpful to us. Establish a comprehensive accident reporting system in your schools. By comprehensive I mean, have all accidents, regardless of where or when they happen, reported to some designated person who in turn may analyze them. It will take a while to build up enough statistics to determine the program needed, but all efforts toward this end will be well repaid in helping to design a safety education program to meet the needs. If you do not have a reporting system in your school, start one now.

Another way of determining the needs of youngsters is by having the local police department furnish a list of all accidents investigated by them which involved school-age pupils. Make an effort to get them to use the schools' report form, as this will give the information you need, thereby enabling you to strengthen your school program.

In most cities, the fire department officials are most co-operative in working with the schools in determining where emphasis should be placed relative to needs for fire prevention and fire protection education. Ask them to give you a monthly report or to set up a spot map giving the location, the cause, and results of fires in your city. Last, but not least, visit the schools and talk with the youngsters. What you find out from them will be an inspiration and a great help to you.

It was my privilege to talk with some 6,000 pupils in the Oklahoma City schools last school year. In so doing, I learned of their many problems. Many of them did not know the safety practices to follow in riding a bicycle. This indicated the need for a bicycle instructional program, which was immediately started.

*Planning a program*—Establish an overall safety committee for the school system, with each school having representation on the committee. This group has as its principal responsibility the setting up and establishing of general plans for safety education in the school system as a whole. Methods on how the different aspects of safety education can be placed in the curriculum and the subject matter that should be taught in each phase of the program can be determined by this group and transmitted by each representative to his or her own faculty group.

Each school should set up a faculty safety committee to plan the program for the respective school. This committee must decide ways of placing the program into the curriculum; that is, whether safety shall be taught as a separate subject, taught through unit study, through co-curricular activities, integrated into the existing program, or by areas of interest. It is not necessary and probably not best that all schools use the same method.

Elementary schools can usually do the most effective job through integration and by using safety as an area of interest. While in the secondary schools, safety may be taught as a separate subject, or as a unit on each aspect of safety, or as a co-curricular activity. And in some cases it should be integrated. The program should be broad enough to help pupils in their whole environment.

If a program of driver training and driver education is needed, it should be offered as a separate course with credit and put into the curriculum on the same basis as any other course in the curriculum. Safety councils and clubs are co-curricular activities which involve many pupils and will be a great help in solving the safety problems of any community. Of course industrial safety should be taught as a part of the shop instruction.

Each school should establish a working relationship with all interested community agencies and call on them to assist in the schools' program. We must remind ourselves of the fact that the best results are obtained in a safety education program when we can get a lot of things done co-operatively by a lot of people. The following agencies are usually waiting to assist the schools in their program: police department, safety council, fire department and parent-teachers association.

*Putting the plan into action*—The plan as worked out by the committee should be thoroughly explained to the faculty of the school by the administrator. The principal's thinking will do much to color the thinking of his faculty. Each faculty member should be helped to determine how he can fit into the program or fit the program into his subject area, to know where teaching materials can be secured, and what members of the central office staff can be of help. In many situations you will find it advisable to establish an in-service course for teachers. Many state colleges do not offer courses in safety education; in such case, an in-service program will be of great help.

The best results in safety education will be realized through a long range program with a short range attack.

*Evaluating the Safety Program*—The program should be evaluated at least once each year to see if the objectives are being attained. Criteria that can be used for making the evaluation are:

Is the child prepared to live successfully and safely in a highly complex and mechanized society?

Has the program provided for systematic and regular inspection of the school plant, grounds and play apparatus?

What phases of the instructional program need to be emphasized at any given time?

Is pupil achievement measured by testing, pretesting and achievement testing?

A safety education program must prepare pupils to participate safely in their activities now and in later life if the program is adequate.

# The Small City Meets the Challenge, Too

By LEWIS E. CLARK
Chairman, School Safety Committee, Public Schools, Lansing, Mich.

The accident problem is no respecter of persons, places, or population figures. Large city schools have no monopoly on the responsibility to educate for safety. All schools have the opportunity to do their share in reducing the accident toll. For example, the rural agricultural high school must do a job of teaching future farmers how to farm without sacrificing life or limb to machines and animals. The prevention of farm accidents should be as vital a part of the agriculture curriculum as the selection of seed or breeding stock.

In the larger, more industrial, less rural city, greater emphasis will have to be placed on safety in the street and on the playground. In general, the larger the city, the greater the emphasis which must be placed on pedestrian and bicycle safety.

But in cities of all sizes the schools must eternally campaign against home, play and school accidents. All communities have their seasonal and common recreational hazards. All face the ugly spectre of uncontrolled fire. Schools in towns of all sizes are turning out street and highway users, potential operators of motor vehicles. No school can shirk its duty to prepare pupils to cope safely with those hazards.

How can the "small city" school system provide this needed safety education? As one who definitely has no claim to being an expert, I should like to propose some fundamentals:

*First.* The school administration must believe in the need for, and the possible effectiveness of, safety education. This must be a sincere belief—not lip service. No school safety program has much chance without this sincere belief. No school system with an alert, up-to-date superintendent should lack this fundamental.

*Second.* Each school system needs a "safety person." Call him what you will, director, supervisor, co-ordinator, chairman, or give him no title at all, but make him responsible for promoting and directing safety education in the system.

The amount of time which can be given this person for safety education work will and should, vary with the size of the school system. The smaller cities cannot hope to have anyone devoting more than part time to safety education. There are so many jobs to distribute among the members of school staffs, already too small to take care of "readin', ritin', and 'rithmetic." However, any system which puts safety education last in the assignment of time and duties has a serious flaw in its philosophy of education.

Regardless of how much time may be assigned to it, the job is important and has far greater chance of being done if some one is vested specifically with responsibility. I believe many city and town school safety education programs are haphazard and inadequate for lack of a "safety person" in the school system. Safety education lags in these places, not for lack of facilities, materials or interested teachers, but because it *lacks direction from within.*

*Third.* Have safety patrols and capitalize on them for their ability to focus interest on accident prevention. Probably no other safety activity has greater ability to attract and hold public support and pupil interest. Even though street traffic in the smaller towns may not merit patrols, the playground will. So, also, will the school busses.

*Fourth.* Use the available safety helps in your community, your state and the nation. Don't hesitate to call on the organizations which can provide something your school program needs. Use the police department, the auto club, the service clubs, the insurance companies, the National Safety Council, etc. However, if the Doakes insurance agency objects to Broadbeam's advertisement on safety equipment donated to the school then your town may be ready for a local Safety Council which can pool the accident fighting resources of the community and eliminate such bickering. This brings me to my city and my last fundamental.



*Fifth.* Have a school safety committee. If I have anything unique to bring you from our Lansing experience, it is in connection with the Lansing Safety Council and its school safety committee. But, first, I need to give you a little background.

Lansing is a city of many interests, businesses, industries, and some 100,000 people. With the state government, including the vehicle, driver licensing and highway departments in its midst, as well as large automobile plants and many smaller industries and businesses directly related to the automobile, Lansing is wheel conscious. In fact, it is so wheel conscious that Lansing has more motor vehicles per capita than any other city in the world.

About 10 years ago traffic on the city streets had increased to an alarming point, and a shocking number of traffic injuries and fatalities were being experienced. A group of prominent industrialists, business and civic leaders met together and hatched an idea. That idea grew into the Lansing Safety Council.

Prior to this, on numerous occasions, squabbles had arisen before the Board of Education between rival donors of materials for pupil use. Use of the donating firm's name always marked the difference of opinion. So, from the very outset, the Council earmarked funds for school safety materials. The objective was to produce educational aids for use in schools with funds donated by many concerns and agencies interested in promoting safety. No individual firms were to receive printed mention on the materials. The only sponsoring credit was to be to the Lansing Safety Council.

This plan has been followed with rather noteworthy success, both from the educational value, and in the very prideful public spirit developed among the contributing organizations. During the past school year the Lansing Safety Council produced and distributed, for the use of school pupils alone, more than 65,000 pieces of original printed materials. This was in addition to all of the materials included in the National Safety Council school memberships. These memberships were also supplied to more than 40 schools in the Greater Lansing area by the Lansing Council.

How was it possible to get this work done at practically no expense to the school system? The answer is two-fold: money contributed by a majority of Lansing's business, industry and civic agencies in the form of memberships in the Lansing Safety Council and the Lansing School Safety committee, which did the work.

Now, I should like to show you that this committee is not unique at all. From its inception, soon after the organization of the council, it has been intended to be truly a school committee, composed of people close to the production department—the classroom.

Its membership includes a high school mathematics teacher; a junior high school science teacher; two elementary teachers; an elementary principal; the police sergeant in charge of safety patrols; the directors of elementary education, art, industrial arts and home economics. Also included are the technical school print shop teacher, the superintendent of schools for the local Roman Catholic diocese, a senior high school assistant principal, a driver education teacher, a woodshop teacher and a junior high school physical education teacher.

This group, meeting about six times a year for dinner at the expense of the Safety Council, threshes out problems affecting the safety of pupils and concocts ideas on new and better ways to teach safety. I think it has more than justified its existence by its works.

It has done yeoman service in producing pupil and teacher materials, thanks to the talent, clever ideas and energy of its members. It has studied building, playground and street hazards, and filed recommendations. It has passed upon proposed programs and contests to be staged by non-school groups in the schools.

It has aided and abetted in implementing the bicycle inspection and licensing program. It has promoted parent attention to the problems of safety, and it has grappled with such imponderables as how to stimulate teacher interest in safety education, what can be done to get youngsters to ride their bikes safely, and where driver education can be placed in the curriculum.

If we have a safety education program in Lansing which merits our pride, I believe it is largely because of these things:

*First:* A school administration which believes sincerely that schools do have a

strong responsibility to educate for safety and that education can reduce accidents.

*Second:* An outstanding system of school safety patrols.

*Third:* A corp of very fine teachers, many of whom are vitally interested in safety education. Much credit goes to the director of elementary instruction who is not only an ardent advocate of school safety work, but is herself an unusually capable safety education technician.

*Fourth:* The work of the school safety committee, which helps, and, in turn, is helped in its efforts by the other three.

In conclusion, the small cities are mighty important because there are so many of them. If any real progress is to be made in total accident reduction, small city schools must do their share. I am confident that they have the ability, and the raw materials. I am hopeful that they also are beginning to launch the attack.

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# Programs of Safety Education in Ohio

*(An Outline)*

**By PAUL E. LANDIS**

**Supervisor, Health, Physical Education, Recreation and Safety, Ohio State Department of Education**

I. *Driver Education and Training in Secondary Schools.*

1. Responsibility for program placed in the Division of Health, Physical Education, Recreation and Safety, State Department of Education.
2. A Co-operative and Co-ordinated Program.
   a. State Department of Education
   b. State Highway Department
   c. State Highway Patrol
   d. Bureau of Motor Vehicles
   e. Ohio State Automobile Association.
3. Services rendered by the agencies and departments involved.
   a. State Department of Education
      1. Supervisory services through the Division of Physical Education, Recreation and Safety
      2. Development of standards and course of study
      3. Distribution of materials, manuals, textbooks, certificates of proficiency, and *traffic safety materials*
      4. Promotion and publicity of the program through talks, meetings, conferences, etc.
   b. State Highway Department
      1. Publication of the course of study
      2. Distribution of traffic safety materials
      3. Traffic Safety Co-ordinating committee of state officials—implement program of traffic safety and driver education and training.
   c. State Highway Patrol
      Three hours of instruction given in each school as follows:
      1. One hour—visual program containing slides and scripts on safety
      2. One hour—quiz program
      3. Participate in graduation exercises by presenting certificates and signing driver's license application.
   d. Bureau of Motor Vehicles
      1. Co-operates in the issuance of the driver's license
      2. Distributes copies of motor vehicle laws to schools.
   e. Ohio State Automobile Association
      1. Furnishes textbooks and materials to schools through local auto clubs
      2. Assists school boards in obtaining dual-control cars and decals for same
      3. Gives invaluable assistance in promoting the courses throughout the state.
4. Participating schools
   During the first semester of the present school year 1947-48, there were 85 schools offering approved courses in driver education and training. An additional 62 schools are planning to offer such courses next semester, making a total of 147 schools in the state. Schools offering the course range in size from large city high schools to small township schools with student enrollments of from 200 to 3,000. In most of them, the teachers in this field give approximately half-time to driver education and training, while in some of the larger schools, teachers are employed to teach driver-education and training on a full-time basis.
5. Training teachers
   The program is growing and expanding as indicated by the many letters of inquiry. To meet the need for qualified teachers in driver education and training, we must have a program of teacher training.
   The following approved teacher-training institutions in Ohio have course offerings during summer sessions: Kent State university, Miami university, Ohio university and Wilmington college.
   In addition, the State Department of Education sponsors intensive institutes of a week's duration for the training of teachers. During the past three years, such institutes have been held at: Cleveland college; Western Reserve university; Ohio State university; Kent State university; Dayton university.

II. *State School Shop Safety Program*

1. Responsibility for program in the State Department of Education
   a. Division of Health, Physical Education, Recreation and Safety, and
   b. Industrial Arts Supervisor
   c. Division of Vocational Education.
2. A co-operative program
   State School Shop Safety committee has representation from
   a. The State Department of Education
   b. The Industrial Commission of Ohio
   c. The Ohio State Safety Council
   d. School Safety Council
   e. Industrial arts supervisors
   f. *Instructors of industrial arts*
   g. Safety engineering societies
   h. Teacher training institution
   i. School Superintendents Associations
   j. The National Safety Council.
3. Purpose of the program
   a. Develop standards for school shop safety
   b. Develop a program of school shop safety
   c. Develop a school shop inspection form
   d. Develop an accident reporting form.

III. *Safety in the Secondary Schools*

Program consists of:

1. A unit on accident facts and preventive measures, as a part of the health instructional program.
   a. Accident prevention in the school
   b. Accident prevention in the home
   c. Accident prevention on the farm
   d. Accident prevention in industry
   e. Traffic accident prevention—related to the driver education and training program.
2. Correlation and integration with various subject areas, such as physical education, home economics, sciences, industrial arts, shop work, and others.

IV. *Safety in the Elementary Schools*

Program consists of:

1. School safety patrols
2. School bus patrols
3. Safety a part of health instruction—in health series.

V. *Other Safety Activities*

Through representation on various committees, the State Department of Education co-operates and participates in other safety programs. The state supervisor of Health, Physical Education, Recreation and Safety serves on the following committees:

1. Chairman of the State School Shop Safety committee
2. Member of the Executive committee and the School and Child Safety committee of the Ohio Traffic Safety Council.
3. Member of the Board of Control of the Ohio State Safety Council and Committee on School Safety
4. Member of the Farm and Home Accident committee of the Ohio Farm bureau
5. Member of the Governor's State Committee on Fire Safety and chairman of the Committee on Education
6. Represents the state director of education on the Traffic Co-ordinating committee.

VI. *CONCLUSION*

*Entire program follows the basic principle* of mobilizing all resources and co-ordinating the activities of official and voluntary, public and private, professional and lay organizations interested in safety education.

# Recent Research Findings in Safety Education

By HERBERT J. STACK
Director, Center for Safety Education, New York University

It is difficult to cover the variety of research contributions to safety education during recent years. As a matter of fact many of the best research projects may not be doctoral or master's theses, but rather may be curricular developments in organized programs of safety education.

is interesting to note that when I entered the field of safety education some 19 years ago, there were only 4 research studies on the higher level. Today there are over 60 that could be called advanced studies. In those days we had to refer to Streitz[1], Vaughn[2], Henig[3], and to the Twenty-Fifth Yearbook of the National Society for the Study of Education[4] as about the only research studies in the field. Today, however, there are many fine studies that have been published or that are to be found in university libraries.

The same is true with regard to textbooks and safety readers. In the early days we had to refer to Payne[5] and Harriet Beard's *Safety First for School and Homes*[6], together with certain publications of the National Safety Council, as the only books in the field. But today a complete safety education library would include well over 200 textbooks, pamphlets and readers. Gradually, we are developing a body of literature in safety education that will give us a broader and more dignified standing.

Before reporting on some of the recent research, I would like to call attention to certain significant developments that are related directly to your own work. The first of these is the recognition that is being given to safety education in the appointment of new state supervisors of safety education, city supervisors, and directors of school and college divisions of local safety councils. I can remember the time when there was only one city or state supervisor. But in recent years the number has been increasing, and the day is not far distant when most of the larger cities will have someone appointed to a position of supervisory responsibility.

The second development of special interest is the recent growth in college courses in safety education. During the war period the number of institutions offering courses fell off sharply, but much ground has been regained in the past two years and the registration in college courses in many states is steadily increasing. One notes that during that period, West Virginia has trained well over 250 teachers of driver education in two of its colleges. Iowa also has made notable progress in this direction, as has Colorado. The State College of Education at Greeley, for example, during this past summer had more than 120 teachers in three credit courses in safety education. Another notable step has been the Pennsylvania State Department of Education's move to require several courses for teachers who are to instruct in safety education in the schools. I mention this because we feel that one of the best aids to persons charged with supervisory responsibility will be the in-service and pre-service training of teachers for both the elementary and secondary schools.

Another interesting development has been the steady growth of driver education and training. Some of you may have seen the findings of the survey conducted by the Association of Casualty and Surety Companies in connection with the Annual Award[7]. The enrollment in courses during the past year was almost three times that of the previous year. For example, you will note that North Dakota had 100 per cent of its eligible students enrolled, while Arizona had approximately 50 per cent. But there were states that had less, than 1 per cent enrolled, so that we have a long way to go before reaching even a good sized sampling of our secondary school enrollments.

I would like to discuss several important research studies. One of the most recent and most interesting is Sidney Birnbach's "A Comparative Study of Accident-Repeater and Accident-Free Pupils".[8] There has always been a question as to the characteristic personality factors that make for repeated accidents among children. We have always known that some children get into all kinds of trouble, while others are comparatively accident free. I will not go into detail on the Birnbach research, which is to be reported at another session of this Congress, but I do want to emphasize certain implications of his research. Birnbach found that, of the various instruments that he used to measure the personality characteristics of children, the one that had the highest critical ratio or predictive characteristic value was knowledge and information. He found the probability as high as 99 chances in 100 that knowledge tests tend to differentiate accident-free from accident-repeater pupils.

While we must admit that Birnbach's sampling was small and one can criticize brief studies of this type, the implication for further research is very important, particularly since the question of knowledge and information is also borne out in the more recent study on the driver reported in a monograph by the Eno Foundation for Highway Traffic Control[9]. Birnbach found that the attitudes and maladjustments among repeaters was significantly higher than among the "free."

All of this tends to reinforce us in the work that we are doing—trying to educate children in knowledge, skills and attitudes towards the various natural dangers of their environment. If children who are thoroughly informed regarding the school programs tend to have accidents, then it is up to the school to reinforce its program so that they will be better informed.

A second investigation which has been published as a monograph by the Eno Foundation[10] should also be of interest to us, not so much because we will be setting up clinics for drivers in the states, but because of the implications of the findings. Here, again, of the 14 instruments that were used in measuring serious accident-repeater and accident-free drivers, knowledge and information showed about the most significant differences. Faulty attitudes, emotional instability and personality maladjustments also showed differences. On the other hand, while a complete battery of six vision tests was given, there were no striking differences indicated between the two groups.

All of this reinforces our belief that the work that is being done by the schools in teaching young people driver education should be most valuable, provided, of course, that the instruction is of good quality. It also strengthens our findings that attitudes are extremely important in good driving. Here is one definite weakness in the average high school program. While state or city courses of study might stress among the early objectives that attitudes are important, altogether too little specific mention is made and lessons suggested for the day-by-day encouragement of good attitudes as a part of classroom and road instruction. We cannot assume that attitudes will improve unless we provide instruction simulating situations that will tend to improve attitudes.

Those of you who are interested will find a much longer discussion of how to improve attitudes in a forthcoming volume to be published by the Eno Foundation, "The Driver—His Nature, Needs, and Training."[11] Suffice it to say it is going to be far more important in the limited time that we have youngsters in driver education courses to provide specific lessons on attitude improvement and to devote less time to the four-stroke cycle, mechanics of the car and other problems not directly related to good driving practices.

A third research has been completed recently by Seaton[12] and will be published this fall by Prentice-Hall. It goes far beyond the early studies of Lloyd and Eastwood in the field of athletic accident prevention. Seaton's research will provide physical educators with specific steps for the prevention of accidents in all sports and physical education activities.

Another doctoral study, completed by DeShaw,[13] now at Monclair State Teachers college, shows the great weaknesses that exist in the states regarding health and safety standards for varsity competitors in secondary schools. The great majority of states have almost no regulations for the safety of competitors in sports. If it were not for the standards that have been developed by such "quasi-official" bodies, as state athletic associations, there would be but few guiding standards for safe practices. As a matter of fact, it is due to this last named that some 20 states have been able to set up athletic benefit funds to take care of disabled athletes.

Conover, working under Lauer at Iowa State, has also completed an interesting study of "Certain Techniques in the Meas-

urement of Driver Attitudes", which makes use of techniques other than those used by Siebrecht in "Measuring Driver Attitudes".[4] As a matter of interest, we feel that the attitude side of driver education is so important that we are planning to use this year 5,000 copies of a new attitude publication and 10,000 copies of the Siebrecht Attitude Scale in a new emphasis project in the high schools, "Setting the Stage for the Improvement of Attitudes of Younger Drivers".[5] These will be distributed on a complimentary basis through state departments of education.

Another interesting study by Johnson of Tulane, though published more than a year ago, should be read by those interested in driver education. This is "Detection and Treatment of Accident-Prone Drivers"[6] and is a critical study of the driver-testing movement.

I would like to mention also the two National Commission on Safety Education publications "Safety Education for Teachers".[7] These are both useful contributions to the field.

Another research study by a psychologist, A. C. Van Dusen of Northwestern university, is based largely on the questionnaire technique for measuring characteristics of accident repeaters. While I have seen only the publicity release, it would appear to confirm earlier findings that the psychological characteristics are not as important as the attitudes, practices, opinions and experiences of drivers. It will be noted that during the past few years a great deal of attention has been given to research in the field of traffic.

Year by year we are adding some bits of knowledge and information to help solve some of the problems of safety education, but there are still many unsolved. We still have a long way to go before we can rival our friends in the health and physical education field and in many of the other school subjects, but we are on the way.

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## Scheduling Driver Education and Training

By RAY N. McFARLIN
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Driver education is the term applied to the classroom work which comes before or goes with road instruction.

Driver training is the term applied to the road work or actual *in the car* or *behind the wheel* training.

The scheduling of the driver education class is no problem in administration. In some rural communities, a traveling teacher is hired by two to five school districts and is regularly scheduled for each district. Salary is divided up among the participating schools. The driver training or road work presents a little different problem because of class members.

To find out what the rest of the country was doing, a survey was made of 75 localities in various parts of the country which have driver education and training. Fifty-six replies were received. In this survey only a few of the larger cities were contacted. Most of the reports were from places that used only one car in their program.

Many things came to light in this survey. There certainly is not too much uniformity in the teaching of this subject throughout the country.

Class sizes range from 8 in Chattanooga, Tennessee, to 48 in Des Moines, Iowa, Snohomish, Washington, and Bedford, Pennsylvania. The average class size runs from 20 to 30.

The length of the class period varies only from 5 to 10 minutes with one exception. Harmon, West Virginia, has theory sessions for 120 minutes each for a total of 66 hours a semester.

The number of recitations a semester varies from 10 to 100, the greatest emphasis being on 30 or more.

The number in the car in the road work was fairly stable, 4 plus the instructor is the general rule although in a few places there are only 2 or 3 to a car.

In Lebanon and Springfield, Illinois, and St. Joseph, Missouri, driver education but no driver training is given.

In the scheduling of driver training, most of the student driver training time is scheduled by the instructor using (1) study hall time, (2) free time and, in a few cases, (3) physical education time.

The number of hours of training in the car varied from 4 to 54 hours and actual behind-the-wheel training from 1 hour to 12 hours. Six to 8 hours seemed about the average.

In Ohio, the state department of education says that if a driver's license is to be issued without an examination the driver education and driver training course should consist of a minimum of:

1. 36 clock hours in classroom instruction
2. 24 clock hours in the driver training car, a minimum of 6 hours of which shall be spent in behind-the-wheel practice.

This survey worries me and others I have talked to because too many localities are having driver education and training seemingly on a token basis rather than on an educational basis. Too much of this sort of thing can do much to harm the driver education training program nationally.

Just because cars are easy to obtain and everybody wants to get on the "bandwagon" is no reason to say, "Let's teach driver training."

National minimum standards certainly should be established, and every effort of the National Safety Council and the American Automobile Association should be used to insist that these minimum standards be maintained.

## State-wide Legislation and Regulations for Safety Education

By ROBERT W. EAVES
Secretary, National Commission on Safety Education of the National Education Association, Washington, D. C.

It is an accepted principle that the content of the school curriculum, as well as the administration and the instructional program, should be left to local and state boards of education rather than prescribed by legislation. Under school laws in most

states the state board or state superintendent has authority under his general powers to prescribe curriculum subject matter. The teaching of a subject can be made mandatory by local and state boards of education.

In many instances, legislation in certain fields of subject matter has been enacted. Much of this legislation has been that concerning citizenship and character education. For example, the teaching of the evil effects of alcohol and narcotics is required by law in some states. In recent years, safety education has approached this status.

In 1947 several states enacted legislation requiring some kind of *safety education*, mainly driver education. An example was that of the California law. This law requires secondary schools to give driving instruction to all students, if provided for any group or number of students. The law is now considered to be unsound. Those sponsoring it recognize that it must be changed. As a result of the law, some school authorities took the attitude "Let's not have driver *training* at all, if we have to have it for all students."

It is undesirable to write curriculum requirements *into statute* because (1) it takes away from school boards' authority which logically belongs to them; (2) it results in a situation which makes it difficult to change or adapt the curriculum to the needs of the people; (3) it makes the school instructional program subject to being controlled by political cliques or pressure groups, regardless of the needs of all the people. It is generally felt that schools and school boards will be considerate of curriculum needs if those needs are made known through parents' groups or other sources which express the opinions of many people.

Public support for legislation regarding curriculum content is usually uninformed of the manner in which the schools operate and how real learning experiences take place.

A review of the state regulations of Safety Education in the United States, prepared by the American Automobile Association in 1946, shows many states with some kind of direct legislation making safety legislation in safety instruction mandatory. The research division of the National Education Association has agreed to make a more comprehensive study of this situation and to provide information that will assist the National Commission on Safety Education to prepare a policy statement on this problem.

It is quite certain that state laws requiring the teaching of safety education do not result in a more effective program.

## Utilizing Athletic Accident Benefit Plan Experiences for Reducing School Accidents

By CHARLES E. FORSYTHE

State Director of High School Athletics and Secretary-Treasurer of the Athletic Accident Benefit Plan of the Michigan High School Athletic Association

In its publication, *Accident Facts—1948 Edition*, the National Safety Council reports that 55 per cent of all student accidents occur while boys and girls are under school *jurisdiction*; that is, either on the school premises or while students are going to and from school. This means that more than half of the accidents occurring to children of school age occur during the seven or eight hours that they are under school supervision; thus, during the remaining two-thirds of the day, less than half of the student accidents occur.

When these facts are considered it is apparent that a challenge is presented to the schools of this nation to do everything possible to protect children under their care. The same publication further states that, of the accidents to all children of school age, 26 per cent occur in school buildings, 22 per cent on school grounds and 7 per cent while students are going to or from school. Further, it is significant to note that, of the 26 per cent of the injuries received by all students in school buildings, 25 per cent were in gymnasiums, dressing rooms, swimming pools or shower rooms. Among high school students, the accidents in gymnasiums and associated areas accounted for 33 per cent of all accidents on school premises, with 28 per cent of them occurring in the gymnasium alone.



### Accident Benefit and Protection Plans

This discussion is an attempt to indicate the growth and development of athletic accident benefit or protection plans in the three-fourths of the states of the nation which have them, and to relate, if possible, their findings relative to the reduction of the number of school accidents.

Some of you may ask the question, "What are these Athletic Accident Benefit Plans?" The first one was established in Wisconsin by the Wisconsin Interscholastic Athletic Association under the direction of the executive secretary, Paul F. Neverman. To Mr. Neverman should go the credit for having "fathered" the idea and the general principle that high school athletic associations are, and should be, concerned with the prevention of injuries in athletics; and, when they do occur, that it also is the responsibility of high school athletic associations to aid schools to meet at least part of the costs involved. Originally, the purpose also was to obtain definite data as to the "how, why, and where" athletic injuries occur. Prior to 1930 there was little statistical information concerning these questions and Mr. Neverman felt that if such data were available it might be of decided use in a program to prevent accidents.

The movement which began in Wisconsin now has spread to more than 35 states. Although there is no central clearing agency as yet, athletic injury information is obtainable.

Again, the question may be asked why regular commercial insurance companies did not enter this field. In Michigan, at least, when the casualty and accident insurance companies doing business in that state were contacted, they said that they had no statistics or experience on which to base such risks.

That reaction generally was obtained in other states when similar requests of commercial companies were made.

Wisconsin, therefore, set up a limited schedule of benefits for certain types of injuries and proceeded to cover students participating in practice and in regularly scheduled games in specified athletic activities. Comparatively small school membership and student registration fees are paid for the benefits which are provided. Benefits, in turn, are limited as to the amount allowable.

At the present time, 26 states are sponsoring benefit or protection plans through their state high school athletic association offices, or, as is the case in New England, there is a sectional arrangement whereby a benefit plan is sponsored by the New England Headmasters' association.

In several other states there have been co-operative agreements set up with commercial insurance companies. This arrangement has developed comparatively recently when such companies have been able to utilize the data which state associations sponsoring benefit plans have accumulated over the years.

As indicated above, some state athletic associations have found it advantageous to affiliate with commercial companies for the handling of athletic injuries. By so doing, they have relieved themselves of the details and clerical work attendant to accident benefit plans. In certain of these states it was found that their benefit plans would have to be incorporated as regular insurance companies if they were to operate and, rather than do this, they have used the services of commercial companies which were available.

In other states, however, there have been different rulings received from the legal division or the insurance commissions. Michigan is one of these and the attorney general's opinion given to the state commissioner of insurance in 1940 is to the effect that the athletic accident benefit plan in this state is a voluntary mutual organization of high schools in Michigan to aid its members to meet at least part of the costs incurred in injuries in athletics, physical education and intramurals. As a result of this opinion, 689 of the schools in this state, with a student registration of 31,476, were members of such a mutual association during 1947-48.

In such states as Ohio, New York, California and Iowa, their benefit plans are organized as regular insurance companies and incorporated under the laws of those states. Among the states not operating

benefit plans as regular insurance companies are Wisconsin, Minnesota, Pennsylvania, the New England group and others, in addition to Michigan. Each type of organization has merits which will not be discussed here.

### Wisconsin, Minnesota and Michigan Statistics

Obviously, it is impossible to include in this discussion complete statistics and experiences concerning accidents in various sports and activities from all states. There are presented here, however, some general accident averages in the more commonly known activities from three selected states—Wisconsin, Minnesota and Michigan. Wisconsin has operated its benefit plan since 1930, Minnesota since 1937 and Michigan since 1940. In these three states the average percentages of injuries received in the sports indicated from the date of inception of their benefit plans through 1946-47 are as follows: football—65.3 per cent of all injuries; basketball—20.5 per cent of all injuries; physical education and intramurals —7 per cent of all injuries; baseball—4 per cent of all injuries; other sports—3.2 per cent of all injuries.

During the years indicated of the operation of athletic accident benefit plans in the above three states, there has been a total of 550,660 students registered for protection in athletic and physical education activities. During the same period there were 39,304 injuries for which claims were allowed. These figures indicate that one claim was paid for each 14 registered students, or approximately seven per cent.

Athletic accident benefit plans in most states provide for a scheduled benefit to be paid if an x-ray is taken which is negative to fracture or dislocation. If the experience in other states is similar to that in Michigan, there are allowances made for approximately 40 per cent of all reported injuries for negative x-rays alone. Thus, it is evident that if the negative x-rays are deducted from the total number of injuries reported, the incidence of injuries is considerably lower than the above ratio of one in fourteen. It seems reasonable to give this matter consideration because, in reality, the suspected fracture or dislocation was not apparent when an x-ray was taken. It should not be inferred, however, that the student did not receive an injury even though the x-ray did not disclose a fracture or dislocation, but the seriousness of the suspected injury did not materialize, and thus some consideration should be given such disclosures.

### Types and Frequencies of Injuries

Experiences of states vary concerning the types of injuries received and the frequency of them. Of course, more injuries, in proportion to student registrations, occur in football, as indicated above. This is to be expected because of the contact nature of this game. In football, however, there are certain types of injuries which are more prevalent than others. Dental injuries are very common. The number of fractured noses and collarbones and concussions run high. Fractures of arms and legs also are prevalent. In proportion to the number of injuries received in football, backfield men are more subject to injury than linemen. Forward pass receivers and punt receivers also are vulnerable, as far as injuries are concerned. Injuries in football are more frequent in midfield than on the goal line. Generally, more serious injuries occur either at the start of a half, or near the close of the game when fatigue is an element. Liberalization of the substitution rule in high school football has aided in this respect by allowing the temporary removal of a player from a game because of fatigue or minor injury.

In basketball, cuts, floor burns, infections, and dental and facial injuries are the more common ones received.

Some serious injuries occur in baseball resulting in cuts and fractures, largely because of the nature of the game. When personal contact does occur in baseball there is not the protection to players afforded in football.

Track contributes its share of knee injuries, cuts and cinder burns, the latter often resulting in infections if they are not given proper attention at once.

Injuries received in physical education classes are varied with no definite pattern being apparent. Quite a few injuries occur in shower rooms and swimming pools caused by slippery floors.

Attempts have been made by various high school rules bodies to remedy some of the disclosures made by athletic accident benefit plan reports. As indicated above, in football a more liberal substitution rule has been of aid. It also was found that owing to the tenseness of players at the start of football games, especially at the beginning of each half, there were more injuries received at these times. High school football rules now provide that there must be a three-minute warm up period on the field prior to the start of the first and second halves.

Experimentation is going on constantly in the development of safer playing equipment. Consideration has been given not only the wearer of the equipment, but the opponent against whom a player is competing. Some athletic goods manufacturers now are placing soft material on the outside of helmets and shoulder pads. They still afford the same protection to the wearer, but tend to distribute the shock when two players come in contact with each other, thus giving some additional protection to the other individual involved.

The removal of the goal posts in football from the goal line to the end line also came about as a protective measure. Both the college and high school rules prohibit a defensive team from recovering and advancing a fumble which has touched the ground. This regulation was put into the official rules in an attempt to prevent pileups and rough play.

In basketball there has been an attempt on the part of high schools to safeguard participants by shortening the game and providing for more time out. The extension of the end court line from two to four feet back of the backboard has resulted in a less congested area in the vicinity of the basket with less likelihood of injuries. With the speed of present day basketball, these are important considerations.

In some states there are limitations as to the number of events in which students may compete in track, especially in running events. Again, the welfare of the student participant has been the major consideration in the adoption of such regulations. High school baseball rules also have the provision that under prescribed conditions a player may leave the game and later reenter it. It seems significant that major attention is being given the welfare of participants. We need a great deal more of this sort of thing and high schools and colleges are in a strategic position to render such a service to young Americans.



### Pupil Protection Plans

At least three states, Wisconsin, Minnesota and California, have gone a step further in affording protection to high school students than those states which have confined their athletic accident benefit plans strictly to athletics and physical education. Again, Wisconsin was the pioneer of this movement and the pupil protection plan in that state has just concluded its third year of operation. A student registration fee of 15 cents each is charged the total school enrollment of the previous year. The schedule of benefits is the same as that which applies to injuries received in athletics or physical education. Protection in accordance with scheduled benefits is provided for a student at any time he is under the jurisdiction of the school without regard to the type of activity in which he is engaged. In this connection, however, it should be pointed out that students participating in interscholastic athletics are covered only in case they are registered in the athletic accident benefit plan itself.

During the 1947-48 school year, some significant data were reported. Wisconsin indicates that during this past school year there were 143,112 students registered and 2,937 claims paid under the pupil protection plan. The incidence of all pupil injuries, therefore, in relation to the total number registered was approximately 1.4 per cent. Of the injuries involved, 457 were received on playgrounds in organized games. There were 813 playground injuries in unorganized activities. In classrooms there were 307 injuries. School hallways accounted for 143 injuries. There were 148 students injured on the stairways of school buildings. Gymnasiums are the greatest offenders, there having been 1,060 injuries in that part of the school buildings. There were nine injuries listed as miscellaneous.

Students from the kindergarten to the twelfth grade are covered under the Wisconsin plan and it is interesting to note that, of the 2,937 injuries on which claims were paid, 109 were for accidents which took place before school started in the morning. There were 2,044 injuries received during school time, 506 occurred during the noon hour, and 278 students were injured after school hours.

Reports from California and Minnesota run about the same as those from Wisconsin. In California, however, the fee charged is much higher than in Wisconsin. It was 50 cents per student last year and will be advanced to one dollar per student for 1948-49. The regular State Workmen's Compensation schedule is allowed in California and this necessitates a higher student registration fee.

It will be interesting and significant to note whether or not other states follow the pioneer work done in Wisconsin, Minnesota and California. In some states there is a definite feeling that the school is not responsible for injuries received by students while they are in attendance. In California and New York the opposite is true; state statutes recognize the responsibility of the school in this connection.

### Safety Education

This brief review of statistics concerning school accidents, both athletic and non-athletic, has a meaning for those of us connected with school work, either as administrators or supervisors, and it also places a definite responsibility upon teachers themselves. The teaching of safety habits is one thing, but the use of every possible precautionary measure to prevent accidents *is another*. Highways, public buildings and other areas used by large numbers of people are being constructed today with considerable attention given to the safety of those who will use them.

Railroads have spent large sums of money and devoted considerable effort to educating both the travelling public and railroad employees in the importance of safety. More than that, they have constructed their facilities so that safety is emphasized.

We, in *public* school work today, have these same responsibilities. Our building, playgrounds, apparatus and athletic fields all should be examples of safety. Through the use of facilities which are safe, we are unconsciously inculcating in the minds of students who use them, the fact that safety is of the utmost importance.

Certainly, we as school administrators and teachers, are remiss in our duty, if students under our direction do not learn the importance of safety not only to themselves but from an economic standpoint as well. Since we learn to do by doing, so it is with safety. It is not something that can be taken for granted; rather, safety is the constant repetition of right doing in connection with those things in our daily lives that will prevent accidents, sickness and economic loss.

Today there are available to those who will make use of them, numerous so-called safety check lists. Sometimes items on them seem so self-evident that we are likely to discount their importance. This should not be the case, however, because *it* is good for each of us to take regular inventory of those places and things with which we deal each day. We should be certain that those places and things meet safety standards.

Many life insurance companies have found that it is of definite economic value to them to educate their policy holders so that they will live longer and be freer from accidents and sickness. Fire insurance companies have been supporters of fire prevention weeks. National organizations have sponsored accident prevention weeks. The chief fault in campaigns of this type is that, usually, they are of a week's duration only, whereas they ought to continue for 52 weeks each year.

### Athletic Safety Suggestions

In conclusion, I list a few of the more important things which we, as school people, can do to protect the boys and girls under our supervision. This list is not all inclusive. Many other items of equal importance could be added. In evaluating the athletic program in a high school, it will be well to be certain that the following factors are present:

1. There must be adequate and safe equipment.
2. Generally, there should be a minimum of at least twice as many squad members as there are team positions in the sport concerned.
3. *Playfields, courts,* and *gymnasiums* must be free from injury hazards.
4. Competent, well-trained instructors must teach the activities or coach the sports.
5. Prompt reporting of, and attention to, medical or dental injuries are essential.
6. Students must be physically fit at all times for participation in athletic activities.
7. Students should not wear glasses without protection when participating in athletic activities.



## Figures Don't Lie

By GEORGE P. SILVERWOOD
Director of Safety, Green Bay Public Schools, Green Bay, Wis.

I'd like to have it clearly understood that I'm *not* a statistician. I doubt if there's anyone who detests mathematics any more than I do, or who understands less of mathematical theory and practice. The only reason that I began keeping accident records when I became director of safety in the Green Bay schools ten years ago was that someone at the National Safety Congress that year made the statement, "You can't run a successful school safety program without an accident reporting system."

*So*, we ordered some National Safety Council forms and started an accident reporting system. Each month I'd painstakingly and religiously summarize the individual school reports and send copies to the National Safety Council, the superintendent of schools and the local newspaper. The latter usually *would* come up with a story on the school accident picture. But that was the extent to which our accident records were used.

Then along came 1942 and suddenly I *found myself* out at Tucson, Arizona, studying (among other things) navigation at an indoctrination school for naval officers. That was bad. There I was—the world's worst mathematician—studying dead reckoning and celestial navigation. Fortunately, the instructor was one of these teaching wizards, and it wasn't too long before the stuff began to make sense. I'll never forget one remark this instructor made: "You men should condition yourselves to the fact that no one, whether he's at sea or ashore, ever really knows where he is unless he can prove it—mathematically on paper."

That statement always stuck with me, and when I went back to Green Bay after the war and took over the school safety work again, one of my first moves was to get out all of the back accident reports and get busy with a pencil and paper—*to find out where we were*. To start with, I made a single summary of all of the monthly summaries of the previous year. Then I analyzed this sheet from several standpoints: location, frequency, severity, age level, etc. The results amazed me, and I'll confess to a feeling of chagrin when I thought of how I'd missed the boat in previous years. *This* sort of procedure brought out the whole accident picture in bold relief. It showed you where to look for existing hazards. It focussed your attention on types of child behavior that *should be checked into and dealt with in* the teaching program.

*Now*, please don't misunderstand me. An accident summary alone does not make self-evident the specific weak spots in your safety program. Such a summary *simply* touches off red lights which indicate the areas that need some investigation. I remember that this first summary, among other things, showed that we were having more falls in our school buildings than the latest edition of *Accident Facts* showed for the average school.

Checking back through the individual school reports, I discovered that two buildings listed an abnormal number of falls and that most of these mishaps occurred on stairways. My next step was to study the *individual accident* reports from these schools. The reports from one school showed that a great majority of stairway falls had been caused by toes or heels of shoes catching in a grooved metal *safety* stair tread. I showed the accident figures to the superintendent of buildings and the grooves were filled with asphalt within two weeks—and that solved the problem.

In the other building it was a matter of old wooden stair treads that were worn down to one-third thickness. These were replaced during the Christmas holidays and our stair troubles were over.

The summary showed that we were having an abnormal number of falls on our playgrounds. The individual reports on these accidents showed that a large portion of these mishaps came as a result of insecure footing. Upon investigation, we found that our playground surfaces, composed of a mixture of asphalt and gravel, had weath-

ered and worn to a point that small, round pebbles had worked loose. A light coat of these pebbles covered the surfaces of all but our newer playgrounds, and furnished a sort of ball-bearing action under children's shoes. We swept the faulty surfaces regularly during the balance of the school *term*, and the following summer light coats of asphalt seal remedied the situation.

We discovered from the summary that our accident frequency was high when it came to high school and junior high school pupil traffic to and from school. A study of the individual accident reports revealed that most of the mishaps had happened near the school buildings. It so happens that, on both sides of the river, our junior and senior high schools are located fairly close to each other and, naturally, this caused a certain amount of congestion at dismissals. We held a meeting with the high school and junior high principals and one of them suggested staggering the dismissals. This was done, to the joy of the police traffic department and the betterment of our accident record.

These were but a few of the ways we were able to use our accident summaries. I think I can best describe our experience with the use of these statistics by saying that it made our accident prevention program *intelligent*.

About a year ago, we began to feel the need for passing these accident figures along to the teachers. We felt that this information could help to direct teaching *efforts and that the statistics could* be used to good advantage in mathematic classes and in Junior Safety Council activities. *Just about this time, along came a well* stuffed envelope containing an annual accident summary for the Pittsburgh Public *schools. I guess I'm an unprincipled sort* of an individual because my conscience didn't bother me when I used this report *form. I simply changed the figures* and added a few cartoons and a couple of graphs and charts. It turned out well, too! The *teachers used it to good advantage* and, what was more important, the board of education was quite impressed.

Not having been sued for plagiarism, I again used the skeleton of the original Pittsburgh report in the 1947-48 summary. This time, however, it's illustrated more profusely and I've made a few basic changes to add to the disguise.

This report, which I finished just a few days ago, turned out to be very revealing and proves quite conclusively the value of maintaining an accident reporting system over a long period of time. You see, we began our reporting system ten years ago, and it was only natural to make some long-term comparisons when it came to compiling the report for 1947-48. Among other things, I graphed the accident frequency for the ten year period. This showed a few ups and downs in the first five years, but on the whole, the trend was steadily downward—until last year when we had 16 per cent fewer accidents than in 1937-38. Publication of this fact throughout the community should be a shot in the arm for our school safety program. With a good accident reporting *system*, you can see the fruits of your labors over a period of years, what's more, you can *show results to the taxpayer*.

We did find a number of things in our last report that were disturbing. Last year our daily attendance suffered a loss of 851 days because of pupil accidents, as compared with 662 days in 1937-38. This increase of 33 per cent, of course, indicates that our accidents were more severe than they were ten years ago. In checking through the individual report blanks to try to discover the reasons for this jump in the severity rate, the following facts, for the most part, seemed to account for the upward trend:

1. *Present-day homes have more mechani*cal hazards, and accidents involving machinery tend to be more severe than *other types.*
2. Motor vehicle traffic is heavier and faster moving.
3. *The use of motor scooters and motor* bikes has increased materially in the past few years.
4. Popularity of contact sports and games, such as football and basketball, has increased and, in many cases, this type of activity is unsupervised.
5. Sporting goods dealer in our area report that sales of toboggans, skis and skates have skyrocketed since 1945. Our records indicate that serious accidents in high speed winter sports and games seem to have kept pace with sales of equipment, probably because overcrowding of supervised areas has led to much *unsupervised* activity of this type.

Over the past decade our accident trend would seem to indicate that the best job of *teaching* safe habits and attitudes has been done in our junior high schools and intermediate grades. Our senior high school program appears to have most room for improvement, and we plan to concentrate much of our attention on the secondary school level during the next few years.



## Question and Answer Period on Student Safety Organizations

*Ringmaster:* J. E. Windrow, Professor of Education and Director, Public Services, George Peabody College for Teachers, Nashville, Tenn.; Chairman, Public Relations Subcommittee, Elementary School Committee, N.S.C.

CHAIRMAN WINDROW: I am attached to a teacher education institution, and *I think* the teacher training institutions of America still must find ways of doing the job of getting teachers interested in *safety* and to get a better and more competent way of dealing with the problems of safety education.

We have some children present this morning. I am very glad because they are most helpful in this whole safety education program. In my school, of course, they are the ones who have made it succeed. I would like to raise a question. I would like to ask about the standard rules for the operation of school safety patrols. There were six major organizations in America that came together to work out the rules for the safety patrols. Could you list them? I have here in my hand a little pamphlet that had to be approved by six of the largest organizations in America and these rules govern your activities with reference to the patrol. Do you have a safety patrol in *your schools*?

When six important organizations, such as the American Automobile Association, the International Association of Chiefs of Police, the National Education Association, the National Congress of Parents and Teachers, the National Safety Council, and the United States Office of Education combine their efforts to work out rules with reference to safety patrols, you know that is significant. These standards which govern and control our safety patrols come as a result of the composite effort of those important educational groups and those outstanding national organizations.

Some of you work on a patrol. How were you chosen?

MARTHA COOPER [Evergreen Pk., Ill.]: The seventh and eighth grade girls are on the patrol.

CHAIRMAN WINDROW: Who should appoint the members of the safety patrol?

MARTHA COOPER: Do you mean the captains and lieutenants or just the members of the patrol?

CHAIRMAN WINDROW: We are talking about the personnel of the safety patrol. Does your superintendent or principal have anything to do with your safety patrol?

MARTHA COOPER: Yes.

CHAIRMAN WINDROW: Does he consider it important?

MARTHA COOPER: Yes.

CHAIRMAN WINDROW: Do the parents consider your safety patrol important?

MARTHA COOPER: Yes.

CHAIRMAN WINDROW: Do they think it is good for the boys and girls to be members of the safety patrol?

MARTHA COOPER: Yes.

CHAIRMAN WINDROW: Then if they do, why should it be necessary for parents to give a written statement permitting boys and girls to serve on the safety patrol? Did *your mother* or father have to sign a written statement so that you might serve?

MARTHA COOPER: Yes.

CHAIRMAN WINDROW: What are some of the educational values involved in membership on a safety patrol? What are

some of the educational values of the junior council or any other such organization?

MEMBER: Leadership, discipline, social consciousness.

MR. CHARLES W. TAYLOR [Wilmette, Ill.]: The primary educational value of being on a patrol is to develop good safety habits in the patrol member himself. I believe that a boy or girl who becomes a member of the safety patrol will live longer because of the knowledge of safety that he or she acquires through service to their school and to themselves than the ordinary student attending a school. Patrol members find out for themselves what causes accidents and how to avoid them.

CHAIRMAN WINDROW: Would you have everybody on the safety patrol?

MR. TAYLOR: By all means. Give every child an opportunity to serve.

One thing about patrol work that we have found out in Wilmette is that it holds down our accidents to a minimum. In the past 15 years we have been very fortunate. We have kept records of accidents involving school children going to and from school—and we have not had a single child killed to date.

CHAIRMAN WINDROW: We are dealing with the function of the safety patrol. I think we might have another question. Do any of you remember the three words that summarize the function of the school safety patrol?

MEMBER: Control pedestrian traffic.

MEMBER: Protect the youngsters.

CHAIRMAN WINDROW: How and why and where? I am thinking of the three—instruct, direct and control. They are the three words that point out the function of the safety patrol—to instruct, to direct traffic and to control the children as they go across the street.

MEMBER: Patrols don't direct highway traffic.

CHAIRMAN WINDROW: No, not highway, but they are directing the children as they go across the street. What is it that the partols should *not* do?

MEMBER: Direct traffic.

CHAIRMAN WINDROW: Have you been instructed as to what your safety patrol can and cannot do? Do you mean that safety patrols have no state's rights? Suppose a safety patrol wanted to direct traffic?

MEMBER: They have no business directing traffic in the street.

MEMBER: There are circumstances in which patrols sometimes do control traffic. If there are children crossing during a break in traffic and some car turns the corner when they are crossing, the patrol can control vehicular traffic.

CHAIRMAN WINDROW: But what would these six major organizations say with reference to that?

MEMBER: Don't they consider that the actual directing of traffic is a police function and not a school function?

CHAIRMAN WINDROW: That's right. What should be the role of the faculty in relation to the safety patrols?

MEMBER: The faculty adviser sets up the program, sees that it is carried out, selects and trains patrols and see that they are on duty in all kinds of weather.

GEORGE P. FARKAS [Indianapolis, Ind.]: I think the biggest responsibility of the faculty is to co-operate with the patrol members. Lieutenants and captains bring offenders to the classroom teachers who use this as an educational device to teach safety.

CHAIRMAN WINDROW: Is it possible to have a safety education program within a school where the superintendent or principal is not whole-heartedly enthusiastic about it?

FROM THE FLOOR: No.

MARVEL HILLER [Evergreen Park, Ill.]: There should be a safety sponsor in every school and the superintendent and the police should work with that person to make the school patrol a success. The Evergreen Park School patrol isn't just a traffic patrol. It is also the bus patrol. We take care of the buses and, of course, of school safety.

CHAIRMAN WINDROW: With reference to the resources in the community, has anyone had any unique experience in how best to use the community resources to improve your safety program and safety work?

LONNIE GILLILAND [Oklahoma City, Okla.]: It seems to me that the best way to use the resources in any community is for the school to take the lead and to call in any agencies available to help out with the program. For example, if you are working with fire prevention, you should call on your firemen. I don't mean just any fireman. You should make contact with the fire department to find out who the best person is who can come and work with you on the school safety program.



CHAIRMAN WINDROW: What are the obstacles that really defeat us in our efforts to have a good safety education program?

MEMBER: People don't know enough about safety.

A. L. DANAKAS [Highland Park, Ill.]: I think the classroom teachers are so burdened with work that they do not find the time to spend on it.

MRS. WALTER BERMINGHAM [Evanston, Ill.]: It is the fault of the adults more than of the children. We have been trying to teach youngsters in Evanston safety rules. We have found that parents don't know as much about the rules as the children do. For instance, we tell our children not to cross in the middle of the block. Yet parents bring their children home from school, let them off in the middle of the block and across the street from home, instead of at the corner. We had an accident like that this summer. The parent was at fault in two ways. She let the child out in the middle of the block and the child tried to cross the street. Then the parent drove away and the child was hurt crossing the street. The parent was to blame.

C. W. HIPPLER [Pasadena, Calif.]: I believe that if the teachers are not trained to teach safety you can put the blame on the teachers' colleges and universities training teachers.

MARY MAY WYMAN [Louisville, Ky.]: I believe one thing wrong with our safety programs in many communities is that all safety instruction begins and ends with the safety patrol. We ought to emphasize other phases of safety.

MR. DANAKAS: In our particular school in Highland Park the patrol captain is automatically a representative on the student council. He attends all of the meetings of the student council. He can bring any questions pertaining to traffic safety or any other kind of safety to the attention of the student council, which, in turn, reports to the various classrooms. The student council and the safety patrol are two separate organizations, but one has representation on the other organization.

CHAIRMAN WINDROW: How can we use the safety patrol—its activities and program—in the classroom?

MISS HILLER: You have to teach safety at least one hour a week in Illinois, don't you?

MISS WYMAN: Yes.

MISS HILLER: It seems to me the captains or members of the student council and of the school patrol can be the central core of the safety program.

W. C. YEAGER [Sioux City, Ia.]: We have increased interest in Sioux City by organizing safety hostesses to watch halls and corridors during recess, lunch, before and after school. Safety hostesses are girls from the upper grades, chosen for tact, ability, courtesy and general behavior. They act as guides, they assist in fire drills, and when groups are passing to and from the auditorium or in any other excursions. They wear green belts.

We have more than 350 of these safety hostesses. I would venture to say that every one of these girls will be more safety conscious when she has a home of her own.

CHAIRMAN WINDROW: The more you get these young people doing things, and the more people you can bring into your program, the more people will be made conscious of the need and the problem. I believe too many superintendents, principals, teachers and teachers' colleges are approaching the problem in an academic way. Once a student participates in and shares in an experience, instruction problems dissolve. It seems to me that you have to get more people—children, parents and teachers—identified personally with the program. How can you do that?

MR. GILLILAND: I would like to ask a question of the gentleman who was talking about getting children to participate. Yet you limit participation to members of the upper grades.

MISS WYMAN: That is why I want a safety council organized in every school.

MR. GILLILAND: That is exactly what I propose. Your first grade pupil can go

back with a message to his own group. He'll do a much better job than the sixth grade patrol can do. We should have a representative from every room on the student council.

MISS WYMAN: That would be to cover all phases of safety?

MR. GILLILAND: That is right. Then we could set up an advisory committee of representatives from the PTA, local police, fire department, local safety council and any other civic organization. In this way you get participation of parents, community organizations and every school child.

LAURA M. CORY [Hamilton, Ohio]: We have a junior safety council in every one of our elementary and secondary schools in Hamilton—13 elementary, 2 junior highs and 1 high school. The members that are active are pupils of fourth, fifth and sixth grades. Associate members are from the first, second and third grades. Our safety work starts with our primary children and continues through the twelfth grade. Safety council work is very much the same as that of the safety hostess in Sioux City.

CHAIRMAN WINDROW: You feel the program is most effective on the junior high school level.

MISS CORY: No, we feel it is most effective at the elementary level. But, we have a good junior safety council in our high school.

EARL R. STRANGE [Pottstown, Pa.]: You have just said that you have patrols from fourth, fifth, sixth grades and on up into high school?

MISS CORY: Unfortunately our high and junior high schools do not have safety patrols.

MR. STRANGE: Does everybody have an opportunity to be on the patrol?

*MISS CORY: In the course of time,* yes. The fifth and sixth grade children are the elementary school patrol.

MR. STRANGE: Would you mind differentiating between the function of the council and the patrol?

MISS CORY: Most patrol members are members of the council. They are the nucleus of the council. But the members of the safety council are responsible for safety inside the building and on the grounds, while the patrols are responsible for traffic safety.

CHAIRMAN WINDROW: The patrols deal directly with traffic, *but indirectly they* have an educational function to perform.

MISS WYMAN: I think of the safety council as the over-all organization in safety for the whole school. Every grade, every student and every teacher is a member of the safety council. In the delegate assembly, each class elects its representatives to the council meeting and each representative takes the messages from their class to the meeting and brings back the answers and suggestions from the safety council. The captains and lieutenants of the patrol are members *ex officio*, not representing their classes, but they represent the patrol on the safety council.

The safety council concerns itself with over-all safety, including safety in the building, safety on the school grounds, traffic safety and safety in the home or wherever the child is. The teachers are represented by a faculty member who is the sponsor for the safety council. All work together to promote the safety program.

CHAIRMAN WINDROW: I am curious to know how many of you have safety councils in your schools. [About 30 members raised their hands.]

How many have safety patrols? [About 45 or 50 members raised their hands.]

MR. FARKAS: We have not spoken about the instructional phase. The greatest responsibility of the teacher in elementary grades is to teach safety. How can the teacher utilize the patrol for safety teaching?

T. M. TETSTALL [Fresno, Calif.]: Isn't every teacher in every school a safety advocate? After all, you have youngsters that have been raised for six years with mothers who believe that nothing God ever created was more precious than their own youngsters. She fences in the yard so the child won't mix with other children; she keeps the hammer away from him so he won't mash his finger; and everything possible is done to keep her child from being injured. The kindergarten teacher must be an advocate of safety to carry on the program that was started by the mother. If the teacher isn't an advocate of safety in her classroom, she is not a teacher.

ROBERT W. EAVES [Washington, D. C.]: I would like to speak to you as a



*teacher* and principal rather than as an official of an educational association. I am interested in this matter of student organizations. I believe that before we can decide whether or not we should have any kind of student organization there should be steps preceding it to enable the faculty to see what our safety problems are. Certain problems can be solved through student organizations but certain other problems cannot be solved through student organizations. We ought to decide whether or not those student organizations contribute to the solving of those problems. I would not say that there should be a safety council in every school. Maybe there should be one in some schools, but a student council may serve both for safety activities and other student activities.

There may be 10 or 15 aspects of the school program. Would you say there should be a student council working on each particular problem? We know a student council or a student group will only function when there is a teacher available to work with that group, or teacher who has time and can make the group function.

Student councils just don't operate alone. I think sometimes we go too far when we say there ought to be a safety council in every school. We may have schools where safety patrols are not necessary. I believe we have to look at the problems in each school before we say arbitrarily that every school should have this group and that one and so on.

What are the safety problems? What *is* the nature of them? Are they problems which can be solved through student activities? I have seen student groups organized and then fall flat within a very short time. Why? There were already too many student organizations and there was no teacher available with the time to see that that particular group clicked. I think it is extremely important that we think in terms of the nature of the problem, not just state that there ought to be a definite organization in all schools.

MISS WYMAN: One of the most important problems in a school is safety. Theoretically I will go along with you on the idea that safety can be handled by a safety committee of the student council. But, after some years, you may find that safety is handled best through a very strong committee of the student council, having its own committee sponsor, adviser or safety council organized as such. We do a very good job with safety councils in our elementary schools.

MR. EAVES: I personally have never had that experience. I have seen safety councils organized. I have seen student safety activities function very nicely through committee activities in the classroom and through student activities, but I think we are in danger of organizing too many student groups.

MISS WYMAN: The safety problems are very real to young children, therefore, I believe, you can handle those problems best in elementary schools through student councils.

MR. DANAKAS: Let's go one step farther—don't organize an activity unless it is needed. For example, we have a lot of children riding to school on bicycles. Recently we organized a club, inaugurated a safety test and every child who rides a bicycle to school is a member of the club. Maybe some schools don't have children riding bicycles to school. Then it is not a problem for them. They don't need a bicycle club.

CHAIRMAN WINDROW: Is it conceivable that there is a school without accident or safety problems? Can one teach concepts and attitudes in safety?

B. BRANDON MARSHALL [Hamilton, Ohio]: I want to say that as the director of our local safety council, school safety councils are very important to us. If you give the children an organization they will develop many of their own ideas. They will come up with many ideas that older people may not think of. Recently, during fire prevention week, I had a call from one youngster who, in a very businesslike voice, said, "This is the secretary of the mechanical school safety council. Do you have a film we could use for fire prevention?".

"Yes, sir."

"Can we reserve that film?"

"When would you like to have it?"

"I would like to have it Wednesday." I imagine he was getting a kick out of calling the safety council. That is the kind of service we like to build.

E. TOM THOMPSON [Topeka, Kansas]: I believe that perhaps we have something in Kansas that many states don't have. We have a blackboard safety program. I have been all over the state in the last four months organizing this blackboard safety program. We furnish county superintendents, city superintendents and parochial schools with enough slogans to last the entire year. One or two of these slogans are placed on the blackboard. If the slogan is especially good, it is left on the board for a day or two.

This is a permanent program in the state of Kansas. Students go home to their parents and ask them to help on new, original slogans. That takes safety back into the homes. Every member of the family gets interested in safety.

With such a program, you can have a poster contest in the schools. That, too, gets the parents interested. We are trying to make everyone safety minded.

I am now going around the state for the second time, checking to see whether we might have missed somebody. We reach a quarter of a million people all over the state with our blackboard slogans.

There must be something in the way of safety on the blackboard each and every day for nine months. We find that the schools are very willing to work with us.

RUTH JEWELL [Oak Ridge, Tenn.]: I wonder what contributions a student safety organization can make to education for democracy?

R. W. BUYERS [Toronto, Ont., Canada]: In Canada we have a lot of varying opinions on safety patrols. The best patrol that I have seen operate was in the Province of Ontario. It was so obvious that the boys were doing such a marvelous job that I sought the man who headed the committee who administered these safety patrols. I asked what he gave in the way of reward to the safety patrol members. He said "Nothing." I said, "Do you mean that you don't give them anything for standing out there in the cold?" He said, "No, we look at it this way. All the way through life the people who have the ability are faced with looking after their weaker brethren and their duty in society is starting right here in school and the safety patrol job is treated as such."

CHAIRMAN WINDROW: Would you like to try your hand at that democracy question?

ROY A. LUCAS [Chicago, Ill.]: That is all we are doing—educating for democracy.

MISS WYMAN: To me, your safety council is your greatest opportunity to educate for democracy. You are teaching children to solve problems and you want problems that they can put their teeth into. Safety problems are ones the children can understand. The safety council teaches them to work together, and it teaches them leadership and fellowship. To me, the council is America in miniature for children.

CHAIRMAN WINDROW: One would gather that Miss Wyman is thoroughly sold on the idea of councils—safety councils.

MR. YEAGER: We started out by considering factors that come out of service on the safety patrol. It seems to be the consensus that the individual patrol acquires training, leadership, self control and safety habits which stand him well later in life.

Next, we discussed the function of the safety patrol. It was decided that the function was to instruct, direct and control pedestrian traffic, especially school children. Patrols should not have anything to do with directing vehicular traffic.

With regard to faculty and patrol relationship, it was decided that there should be a faculty adviser whose duty would be to co-operate with and encourage the patrol. We also agreed that the patrol needs the support of the school administration in order to succeed.

The next problem discussed was the use of community support in the safety program. There are several agencies we could make use of—the PTA, police department, fire department and so on.

The question was asked, "What defeats a good safety program?" The first answer seemed to be that the classroom teacher was too busy. It was also pointed out that adults set bad examples. And the point was made that all teachers were not trained to ch safety. I would like to add one other thing. A lot of young teachers coming into our schools today have a minimum of training and safety isn't a part of that training. Many spots where safety could be injected into the program could be found by going through the curriculum keeping safety in mind.

What defeats a good program? Duties may be imposed upon students to a certain extent, but faculty, administrators and parents need to show appreciation for their efforts. Young people appreciate a party, movie, some entertainment or a pat on the back.

We need more positive interest in safety on the part of the community. Safety hostesses in Sioux City have increased interest. We need more persons identified with safety movements—PTA's and all civic organizations. All should be brought in to share in the whole program the entire year.

There is the question of safety participation from kindergarten up to junior safety councils and senior safety councils in the high schools. In many cases, there is the desire to have the whole school act as safety council with a delegate assembly to coordinate the activities to see that safety teaching reaches every individual.

Should we have safety councils everywhere? Can the students solve the problem, if there is a problem? If there is an existing organization, such as the student council, maybe that council can solve the problems through its safety committee.

Are any schools free from hazards? The general consensus is that they are not and that the youngsters will find hazards that we adults may not even know existed.

What do the patrols contribute to democracy? The safety patrols contribute service, courtesy, alertness, and they teach all to practice the Golden Rule. I would say that is an aid to democracy.



## Pupils Belong to Parents, Too

*Presiding:* JAMES W. MANN, Principal, Hubbard Woods School, Winnetka, Ill.; General Chairman, Elementary School Committee, NSC, 1948-49.

**The Problem**

Panel of elementary school pupils from the Avery Coonley School, Downers Grove, Ill., under the guidance of Mrs. Robert Moore.

**The Answer**

Panel of parents and teachers.

*Discussion Leader*—MRS. L. K. NICHOLSON, National Chairman, Safety Committee, National Congress of Parents & Teachers; Chairman, Subcommittee on School and Community Coordination, Elementary School Committee, N.S.C.

*Participants*—

OLGA ADAMS, University School, The University of Chicago, Chicago.

JOSEPH CANNON, JR., Father, Wilmette, Ill.

MRS. W. S. HAINES, Mother, Winnetka, Ill.

CHAIRMAN MANN: I wish that we could consider this meeting a sort of laboratory in which we examine the child—ask ourselves how he thinks and what makes him act as he does, either safely or unsafely. Perhaps we will be able to see some new lines of activity which we could follow in order to help him act more safely.

We few people who come to these meetings have to dramatize safety. We represent, at best, perhaps 1,000 out of 200,000 schools in the country. By approaching the problem from the standpoint of the child himself, I believe we can do a better job. Therefore, we are now going to begin with some children who came all the way from Downers Grove with their teacher, Mrs. Robert E. Moore. They are going to hold a panel on some of the problems they run into. I believe we will see some of the ways in which they think and operate.

I am going to turn the meeting over to Mrs. Moore and her children. They are going to pretend they are back at Downers Grove sitting down, perhaps, in front of the fireplace in the library.

MRS. ROBERT E. MOORE: One of the things that we talked about the other noon when we had our safety council meeting was the question of bicycles and the rules that went with them. After each one

had given his opinion, one of our members spoke up and said, "Now, what are we supposed to do on each one of these things?"

MICHAEL HIGGENS: Dad told me to ride against traffic, and I was riding against traffic one day when a policeman came along and told me to ride with traffic.

JOAN STANTON: My mother told me to ride on the sidewalk so I wouldn't get hurt, but a policeman came up and told me to ride on the street, so I did and my mother was angry.

MRS. MOORE: What is our village law?

JOAN STANTON: It is to ride on the street.

JACK STEWART: I was going downtown one day. There is a law—not exactly a law, but a safety measure—that says to ride near the curb. Cars were parked so that when I rode near the curb, the drivers couldn't see me. A car missed me by only a couple of inches.

BILL BOYD: Mary said she was riding along and a car pulled out of the driveway and hit her bike. She was going so fast that she fell down and hurt herself.

MRS. MOORE: She was riding next to the curb.

PAUL TOON: One day I was riding along when my boy friend stopped and asked me for a ride. I said no because too many people were getting hurt that way.

RICHARD FAUENFELDER: The mothers of the little children ask the bigger ones to let them ride to school.

MRS. MOORE: You mentioned riding with traffic or against traffic. You mentioned riding someone on your bike to school, and you mentioned riding on the sidewalk or street and also riding next to the curb.

Do you want to mention anything more about bicycles?

RICHARD FAUENFELDER: Paul says he stepped on the wheel of a cultivator and fell off and hurt himself. The folks said they weren't supposed to step on the wheel. Then one day Paul was watching another man ride on it, and he stepped on the wheel. So Paul told him he wasn't supposed to do it that way and the man said, "How else are you supposed to do it?"

MRS. MOORE: What happened on the train that we came down on?

JACK STEWART: Coming into the station, nearly everyone got up as soon as we got inside the depot. When the train stopped, they lurched back toward each other. Almost everybody does that. Once a boy was standing in front of me; he was about a head shorter than I and when the train stopped he almost knocked my teeth out.

JOAN STANTON: I was standing on the platform of a train and a man back of me pushed ahead of me and I nearly fell off the platform.

MRS. MOORE: Was he trying to get off in a hurry?

JOAN STANTON: Yes, before the train stopped.

MRS. MOORE: Do you have some more examples?

JOAN STANTON: Yes. We were raking leaves in the fall and my mother told me to put them all at the curb and burn them there because I might start a fire if I burned them on the lawn. I burned them in the gutter and a policeman came along and told me not to burn them there. I didn't know what I was supposed to do.

MRS. L. K. NICHOLSON: I wonder if you all noticed that all of these children are on the school safety patrol.

MRS. MOORE: That's right. They are all members of a committee—either the train committee or the gate committee or the playground committee.

MRS. NICHOLSON: What a grand job we can do if parents and teachers will co-operate in teaching safety! We can then look forward to a generation of safety-minded children and, in later life, safety-minded citizens. I am sure you will agree with me that under our present system the child remains the responsibility of the parents. Teachers, psychologists and pediatricians have their places, but they do not replace the parent—nor has the parent transferred to the state or to the board of education their own responsibilities for their children.

MR. JOSEPH CANNON, Jr.: One thing has been brought to my attention most dramatically. The children talked today of being told one thing in school and something else at home. Maybe it is the parents who need safety education, not the children. The children are getting it, but



we are so smart that we don't need it. We think that our good common sense can tell us what to do. I am sure the child must be terribly confused and he doesn't know whether to believe the parents, the policeman or the teacher. *I hope that the policeman* and the teacher, at least, tell the children the same thing. But, after all, the child must be the joint responsibility of the parent and the school.

When I was a youngster, the only time my mother came to school was when I was in trouble. But today we parents try to know our children's teachers; we try to understand their problems. We attend the Parent-Teacher meetings. I, myself, got so interested in the P-TA that I was put on the school board.

I know that I have often volunteered information without giving the matter a second thought. When the children come to their parents, parents are supposed to know everything. When the children ask us questions, we give an off-the-cuff answer. It is no wonder they get confused.

MISS OLGA ADAMS: I believe that part of our difficulty arises out of the fact—and I am speaking now as a school teacher—that we teach them things with considerable conviction. We teach them hard and final facts. Then the child either sees someone at school not living up to those teachings or the family does something that is contrary to what the child has been taught.

I believe we have to be careful to help them to know how to meet and to react to an environment which seems somewhat *indifferent* to the thing that has been taught in school. Recently I heard a rather striking example. It was fire prevention week. The teacher took her children through the whole line of factors in a home that should be investigated to see whether the home itself was safe from fire. The children were given a sheet to check the items. If they came back with the sheet checked "O.K." in all of the things listed they would get a button. If you have ever seen one of those sheets and then went over your own home, you would know that no child could really honestly get a button. One child was highly sensitive and became greatly disturbed emotionally because she could not get the button just because the family home did not meet all of the requirements. No doubt it was good for the family home to be checked and good for the child to have that responsibility, but it was too bad for the child to be penalized because the family could not meet requirements. So I think we have to be careful, as schools, not to put a child in a situation where he becomes highly disturbed emotionally. He needs to be well informed and he needs to be earnest in seeing what he can do together with his family and school to bring about better conditions. But let's not put him on the spot—a spot that none of us are willing to take.

MRS. W. S. HAINES: I think the mother, in many cases, is guilty of not following along with the safety education the child gets in school. In many cases—of course, I speak primarily from experience with the Hubbard Woods school, where the principals and school officials work together closely—the child is given material that he may take home. If the mother would stop to inquire just what the school does suggest about riding a bicycle on the street and so on, we would not need to put the child in an embarrassing position.

MRS. MOORE: There are two things that might be mentioned. Children are very logical and they go straight to the point. If you tell them one thing and practice another, you have not done anything for the cause. That is one of the biggest complaints we have in our safety council meetings. Our council gets along pretty well with managing the children and telling them where to cross the street; then the children see a parent or someone driving a car who is paying no attention to speed laws.

MRS. NICHOLSON: Mrs. Moore, you have spoken of your council meetings. I wonder if you wouldn't just tell us a little about them?

MRS. MOORE: What we call our patrol system is not all patrol. It is the safety council.

We have children who come to school on the train. We ask the children not to get out of their seats and not to be on the platform, pushing and shoving as they come down the platform, because we are afraid that could cause accidents.

We have one crossing which is a rather awkward one. So we have an interesting project. The safety council is going to the village safety council to ask for a board

sidewalk across the highway so that the children can all cross at the same place, instead of three or four different places.

We have a playground and building committee to see that equipment is put away. In the repair shop the children don't leave boards and nails where people might stumble on them and fall.

Then there is a service committee that takes responsibility for special events, such as a fall festival where we might have a bonfire or other things. Each committee plans its own schedule of duties. Some of the students here are chairmen of these various committees. The gate patrol chairman is here. He makes up the list of children to be on patrol and goes out to see that they are there. He reports to me. I make up our safety lessons for the various committees. They are now printing record cards in our own print shops. The cards show service record and certify the holders named as members. Each card lists all of the jobs the member has and the weeks he has been on duty.

CHAIRMAN MANN: Who has a suggestion on how to educate the parents?

MARY MAY WYMAN [Louisville, Ky.]: Quite often our safety councils send letters telling parents what the schools are doing and asking for their co-operation. Sometimes we ask various parents to give suggestions as to how they would solve a problem.

FRANK PALMER [Arlington, Virginia]: In Arlington, we have boy and girl patrols. These are stationed at corners and intersections near their schools. When cars drive up with the youngsters, the patrol opens the door, thanks the parents for bringing the children, and tells the parents to please move on. We have various other methods of instructing the parents. We have just started a little contest between the parents and the children. The youngsters write letters to their parents telling about the rules.

The speed limit is 15 miles per hour in the school zone. The youngsters tell the parents of the rules for crossing at crosswalks, and so on. If the youngster gets a better score than the adults, the youngster gets a new bike, or whatever he needs. That puts the parents on the spot.

CHARLES W. TAYLOR [Wilmette, Ill.]: We use several methods of reaching the parents. Primarily, the police department is charged with public safety. We feel that the boy or girl attending school is going to be the citizen some day who will be charged with many responsibilities in the village. One of our means of getting to the parents is through the parent-teacher meetings. We supply speakers for them who are well versed in safety education. The speakers explain to the parents that their responsibility has not ceased when the child enters school. There are too many parents who feel that when the child goes to school it is up to the school and the police department to raise him.

Being a police officer myself, I don't as a rule get Sundays off, and I spend all week teaching pedestrians safety. On Sundays sometimes I draw a traffic assignment at a church corner. The parents just drag the children across the street at almost any spot. Naturally the child is bewildered.

In Wilmette the police department and the schools are in accord on all bicycle rules, so the child doesn't have the feeling that the school is telling him one thing and the police officer another. We see that each bicycle is registered and inspected for safety and that a letter is sent to the parents telling just what the rules are and what is expected of them as parents.

(Discussion continued—page 40.)

## Accident Repeaters Among School Children

By SIDNEY B. BIRNBACH
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Since the inception of the safety movement, frequent studies have been made concerning accident-prone adults both in industry and traffic. Such studies have brought forth much interesting information. Little, however, of an experimental nature has been contributed that would help us identify the children who are having repeated accidents. This, in spite of the fact that the important studies of adults having the accident habit revealed that these adults had numerous accidents in childhood. It, therefore, appears that research directed towards a better understanding of the total psycho-biological personality make-up of the child having the accident habit would be getting at the root of our accident problem. The detection and treatment of the accident personality in childhood, before the damaging record is built up, would be the more economical way of handling the situation—in order to save money and lives.

With the realization that effective therapy could be applied only after a sound diagnosis of the accident personality was made, the author set out to evaluate, through scientific methods, the psycho-physical qualities of children who have had repeated accidents.

The investigation included tests which sought out maladjustments in the important avenues of life, such as home, social, health and emotional areas. The battery of tests included measurement of strength, physical fitness, intelligence, safety knowledge, vision and hearing. Also included in the investigation was the study of medical, health, accident and scholastic records of the accident repeaters. As a supplement, personal interviews with the child and important information from teachers and parents aided the investigation. This resulted in a collection of data involving 43 personal traits. The data when analyzed indicated that certain traits characterized the child with the accident habit.

Before the investigation was completed, it became evident to the investigator that two types of personalities dominated the repeater group. The most common type encountered was the hyperkinetic child. Many may not recognize him by that name. Some know him as the "overactive child" or the child who "never sits still"; others call him the "fidgety child." These children are the restless, overactive, aggressive, distractable children whose behavior includes inattention, flightiness of ideas, an explosiveness of motor output; those whose behavior in the school, home and playground includes unpredictable, impulsive behavior. These children are constantly in pursuit of physical challenge and adventure; they even seem to think with their muscles.



Characteristic of this type of child is his striving to outdo others. By so doing he attempts to bring attention to himself, abandoning usual precautions, and thus inviting accidents. This type of child has been observed to play hard to win. When on the losing end, he is quick to flare up and usually seeks to end the contest by engineering a brawl. In anger, he will lash out with such a degree of carelessness which, when judged according to adult standards, would be regarded as bordering on criminal negligence. As a group, children with this type of personality are unusually stoic, displaying a Spartan stoicism when they are injured or when witnessing the injuries they inflict on others. It is not unusual for them to boast of their exploits and they take pride in pointing to their scars as if the scars were so many prizes.

The other type of personality often encountered among children with a propensity for accidents is the moody, introverted and emotionally hypersensitive child. Unlike the hyperkinetic type, the hypersensitive children lack confidence in their abilities and seem to labor under a feeling of insecurity. Such children are sensitive to criticism and flare up easily. Failure to take criticism from parents or teacher gives rise to conflicts from which these children find escape through rebellious action. These apprehensive introverted children in self preservation change outwardly and often become like "Peck's Bad Boy" and, in their effort to compensate for their personality defect, behave in a near delinquent pattern with such recklessness and destruction that accidents become inevitable. By deeds and often by their words, they endeavor to make their tormentors feel responsible for the accident. It is not uncommon for them to say, "I'll get hurt and you'll be sorry," or "See what you made me do?"

Let us at this time consider the results of the experiment with children who were accident repeaters. Certain psychophysical traits stand out and should be useful in aiding accident preventionists in identifying and assisting these children.

Test results showed that these children possessed greater crude strength and superior gymnastic ability than children who were accident free. This is almost to be expected of children who are less inhibited, as repeaters have shown themselves to be,

because they practically live and think with their muscles.

Also indicated was the fact that repeaters were seriously lacking in an attitude and in their knowledge of the major phases of safety in our modern society. One can see how this shortcoming, interacting with the impulsive behavior of the repeater and coupled, in some cases, with physical defects, makes them prone to accidents.

It was also noted that repeaters harbor a significantly larger number of physical defects than children who are accident free. Particularly common defects were in vision and hearing. It is obvious that serious defects of hearing and vision or a combination of both (cases of which were found to exist among those studied) would make one prone to accidents.

What is perhaps not so obvious, but by far more important, are the findings of some psychiatrists that indicate that the general overactivity of the hyperkinetic child often disappears when the offending physical defects have been alleviated. Often it is the physical defect which furnishes the dynamics for personality maladjustments that produce accident proneness. There are numerous cases on record where children have developed reading difficulties because of some defect in vision which was not picked up by the ordinary school vision test. Examples of such would be word or number reversals, as in the word "was" for "saw," or limitations in scanning. Such a child becomes an irritable, inattentive, restless, disturbing and maladjusted child, who blows up in the face of an emergency and invites disaster.

On the other hand, many children with slowly progressing hearing loss, sometimes caused by recurrent middle ear infections or hypertrophied adenoids, are most often not given the benefit of the doubt by their parents or school teachers. They are called inattentive and are labeled daydreamers. Parents frequently do not know there is anything physically wrong with their child. The child is berated for his inattention and failure to obtain good marks. The child is driven, browbeaten, even physically beaten, and deprived of everything.

The introverted child withdraws more and becomes so preoccupied with himself that he becomes a sitting duck in every dangerous situation. The extroverted child becomes agitated, fights back, acts impulsively with frequent temper outbursts—all of which set the stage for his accidents.

Further results of the investigation indicated that greater maladjustments in such areas as emotional, home and health existed among repeaters. The most significant area of maladjustment was the emotional. Here it was found that 40 per cent of the repeaters were maladjusted. These maladjustments are responsible for the antisocial, aggressive, nonconforming and dangerous actions of our repeaters. Our challenge is to understand these emotions, what they mean and how they contribute toward reactions that are unacceptable and dangerous. One thing we must remember in this field of emotional development is that prevention of maladjustment is more feasible than cure.

Another interesting sidelight of the experimental work with repeaters indicated that the repeaters were lacking in courtesy, dependability and industriousness. When compared to children who were accident free, repeaters were less co-operative and less reliant. We can easily see how these personal factors affect the accident-cause picture.

In conclusion, it must be said that the case histories of a large number of the children with the accident habit revealed that their problems arise from twisted emotions which can be straightened out by prompt and effective application of expert knowledge and skills. Sometimes the twisted emotions of adults in the child's environment need treatment. This was evidenced by the fact that 20 per cent of the repeaters came from homes torn apart by either death, divorce or bad health of one or both parents. Also, 70 per cent of the repeaters had a positive history of one or more parents being an emotionally overcharged person (in 32 per cent this quality of temperament was found in both mother and father). Sometimes the general environment itself may be corrected for the salvation of the personality it warps. It is, however, incumbent on a civilization such as ours to heed and respond to the needs of those children who are afflicted with the accident habit, so that the death and destruction they may bring about through accidents be minimized.



# Making Safety Functional in Physical Education

By P ITH EVANS

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I believe that specialists in various fields of education frequently overemphasize the contribution made by the areas they represent.

Today I heard the statement that the safety patrol makes the greatest contribution to the teaching of democracy. I believe that is about as true a statement as the one I heard a few months ago, "all education is the development of physical fitness." My answer was, "Say that to a group of school administrators and see how far you will get."

I would like for those of you who have said today that the safety patrol makes the greatest contribution to teaching democracy, to say that to a group of social studies experts or health experts and see how far you get.

All of us are specialists in education, and we overemphasize, I believe, the contribution made by the area we represent. We as specialists—and I am one of them—quibble over terms and over areas of responsibility. For example, home experts say that health education is home economics. Health education people embrace certain areas of home economics. Those of us in physical education embrace most of recreation and the recreation people feel differently.

Specialists from one area, not always education, sometimes assume authority for areas in which they are inadequate. May I give you an example.

During fire prevention week each year in the City of Springfield I have the pleasure of doing something that I always wanted to do when I was a child. I ride for three days in a bright red automobile owned by the fire department and I ride with a group of fire inspectors who are dressed in uniforms. We visit all of the schools for the purpose of conducting a fire drill. The teachers and children know that some time during fire prevention week they are going to see us. They don't know when. We go in and ring fire alarms. That is another thing that gives me great satisfaction. All of my life I wanted to ring fire alarms!

Recently we met one morning with a district chief of the fire department—a delightful man, co-operative, interested in child safety and a perfectly wonderful person in his own field. I made the mistake of walking through the kindergarten room after the fire drill and saying to the children, "I would like you to meet our friends." I introduced the gentlemen one after the other. Whereupon the district chief stepped out and said, "Do you mind if I speak to these children for a moment?" I began to be skeptical because the first thing he said was, "Do any of you little children ever play with matches?" He went on from there, and it grew worse and worse. We edged him out of the room as quickly as we could. We realized that we had a perfect example of enthusiasm and a good spirit, yet he was getting into a situation where he could not hold his ground.

I work in related fields of health, physical education and safety. Certainly recreation is included. The older I grow, the harder I find it to separate these fields of education; the harder I find it to explain to a visitor of the city just how one of these fields is separated from another.

I know that if one of you should come into my office and say, "Will you take me to a fourth grade tomorrow to see a lesson in health instruction," I would find it very difficult to locate any time of day where there would be a class labeled health instruction. I would find it equally hard to find a given number of minutes that would be labeled safety education. But I think those of you who are concerned with the administration and the organization of elementary schools will agree with me that in a good, well-organized elementary school, it is practically impossible to remain five minutes in any classroom without finding health and safety being taught and practiced.

Sometimes the practices are bad. But teachers are health conscious and safety conscious. Sometimes they are too busy to do an awfully good job about preparation. But they are conscious of health and safety.

Let's consider this field of physical education. I am going to classify our problem under a few headings.

The first one is safety and facilities in physical education. It is obvious that to conduct a program of physical education certain facilities are essential. We need playrooms, gymnasiums, play fields, athletic fields and play apparatus. Safety relates to all of these facilities in various ways. I am going to list five ways in which I believe safety is related to physical education facilities.

Firstly, I believe safety is related to facilities in the selection of facilities. Those of us who are responsible for equipping the gymnasium, for preparing playgrounds and athletic fields and playrooms, select surfacing, fences, equipment and apparatus on the basis of safety.

We study the accident incidence of certain pieces of apparatus before we select it. No educator knowingly selects equipment which is more dangerous than it is usable. If apparatus and equipment and all facilities are not reasonably safe, we do not select them.

Secondly, I believe that the directions for the use of the facilities relate directly to to safety. Teacher leadership is important. Student leadership in this connection helps.

Thirdly, the inspection of facilities—and I believe there are three kinds of inspection—plays an important part. Professional inspection usually occurs about once a year and is made by an expert in the field. I wonder if you people have found it as difficult as we have in our part of the country to have inspections made.

Frequent inspection by the teacher (not professional inspection but adult inspection) is a help, and daily inspection by student leaders and by students themselves every time apparatus is used also helps. All are important to the safe use of facilities.

Fourthly, the safe use of facilities is important.

Fifthly, is the health hazard brought about by overuse of equipment and facilities by the child who is under par physically.

I am a physical education enthusiast and I believe in the activity program. But I also believe that correct interpretation of physical education broadens the scope of that field so, you see, I am being guilty of overemphasis. I believe that good physical education extends all the way from the most vigorous activity to complete rest. I believe that it is just as important for the child who is post-operative or post-rheumatic fever or post-cardiac to have daily rest as it is for vigorous Johnny Smith to learn to play baseball or football.

The second main classification is safety in activities. What about the relation of safety to the program of the physical education activities? I have four points.

First is the selection of the activities. We select activities for the program of physical education on the basis of suitability for age, sight, strength, endurance, ability, interest and student needs. An activity that is too difficult is unsafe. An activity that is uninteresting is equally unsafe because of the lack of attention.

In my second point, the teaching of activities, I wish I could be more specific. I believe that physical education bears the responsibility to teach reasonable precaution in execution and the avoidance of hazards. For example, we are perhaps working on gymnasium apparatus. That apparatus is in good condition. As we teach an activity we have all of the safeguards, such as mats, rings, ropes and all. We guard against over-exertion.

Then, the third point is the practice of activities. The children have learned their activity. What about the practice? The observance of all safety precautions and the volume of activity are important.

The fourth point is meeting emergencies. Teachers and students in the field of physical education should know how to meet emergencies. I believe that the person who has been taught good use and good discipline of his own body usually has developed a set of co-ordinations that make him a little more alert to physical hazards. I don't mean to make any such sweeping statement as "athletics teach character," or "membership in the safety patrol lengthens life."



How can you prove it? Whose character has it improved and whose life has it lengthened.

The human being who has learned to discipline his body and is physically alert *may* be more alert to physical hazards.

Yesterday I was at a luncheon in the home of a friend who lives in an old house. Her living room is divided into two sections and there is a very shallow step going from one section to the other. There were six of us at the luncheon—all busy women who had an hour and a half to spend with this friend and were then going back to work.

Five of us got along fine, but one woman had difficulty with that step. I knew she was going to fall down; just a split second too late I said something. We tried to catch here but she fell. After luncheon, as we came back into the living room, the same woman tripped in the same place in exactly the same way. She did not have the co-ordinate skill either to relax and fall or to catch herself.

The next point I have to make, you may not agree with at all. I believe there is a very important connection between safety and physical education and that it lies in the close connection between safety and competition. In physical education, competition is an essential factor. Competition is very important and is very desirable. Competition is the same thing as good cooperation, if it is properly interpreted. There are three kinds of competition.

First, there is competition with one's self—that is, improving one's own record. I play golf. I play it with friends, and I register my score. I always lose. I am not a good golfer, but I am competing two ways. I am competing with my friends, and I am competing with myself, trying to better my own score. Each time I play, I may win in this competition with myself. Most of the time I play with better players, so I can hope to win very seldom. I can sometimes win competing with myself.

In swimming, we learn to swim faster and we learn to swim longer distances. We are improving our own record. In that way, we are setting a good pattern in competition with ourselves.

The second kind of competition is competition between individuals. Two people say to each other, "Let's swim this distance and see who gets there first." That is a race or a contest. You are matching your skill against the skill of another person.

Then, there is competition between groups where you, as an individual, or I, as an individual, contribute our skill to the composite skill of a group or a team and match that against another group or team.

Safety measures are extremely important in all of these areas of competition. The more highly organized the competition, the more protection is given the participant, the more care is taken of the participant.

In high-powered competition safety rules are observed. In high-powered football there are injuries, I grant, but every precaution is taken. In sandlot football, every precaution is not taken, and that is the sort of competition that worries me.

In competition sometimes we run into a hazard to health in overdoing. We have a field day; we run our foot races in heats and the winner of the first heat goes into the next and the winner of that one goes into the next one. Harm can come from over competition.

There are just two other aspects that are rather general. One is hazards relating to the use of community facilities. We spread our programs of physical education. Take your program out of the school and spread it into the community and make use of all facilities.

In using community playgrounds, skating rinks, bowling alleys and swimming pools, safety precautions are essential.

The last aspect I wish to emphasize is the hazard of clothing in physical education. Today girls wear loafers and it is extremely difficult for physical education teachers to get them to wear the correct shoes for physical education activities.

Misuse of anything—misuse of time, space, equipment, practice of activity—is a hazard. On the other hand, no use does not solve the problem. Misuse is bad; overuse is bad; and no use does not help us.

Skill is essential to good use and to good practice, Knowledge is essential to skill.

Good judgment based on knowledge and skill constitutes a great essential to functional safety in physical education. May I propose a little slogan that I heard just a

few weeks ago? "Be alert and you won't get hurt."

Discussion

ORLO W. MILLER [Madison, Wisc.]: We know there are certain pieces of apparatus on the playground that are especially hazardous, what particular pieces do you people in Springfield try to keep off of your playgrounds?

MISS EVANS: We are very conservative and economical. We are so glad to get any apparatus that sometimes I believe we go overboard. We like the jungle gym type of apparatus. We like swings, if they are protected. We like slides, if they are in a safe place. We like horizontal ladders, if they are in a safe place and I like the giant strides, but all my friends don't agree with me. But I believe supervision of the apparatus is all important. I can keep accident incidence down on practically any piece of apparatus if I can provide adequate supervision.

CHAIRMAN MANN: How can we prevent parents from giving five- and six-year-old children bicycles? And should a child be 15 before he can drive a car?

FRED STRICKLER [Peoria, Ill.]: I don't believe it is a matter of age. You find children who are intelligent in any age group. They seem to be born with that kind of sensitivity which appraises situations and they react safely in all situations. I believe it depends upon the child, not upon his age.

CHAIRMAN MANN: In our school, we allow children at the third grade level to park their bicycles at school. We have control over them in the parking system. The first and second grade children cannot park bicycles officially. The moment we provide a parking place, the school assumes responsibility. Then some mother comes along and says that her child is an exceptional child and uses good judgment and he is very careful. What am I going to say? I have an answer, but what would you say?

MRS. B. L. McINTIRE: I don't know what I am going to do. I have a six-year-old pestering me for a bicycle. There have been three new bikes in the neighborhood since school started, yet here in Chicago, where our traffic is so heavy, I cannot see my six-year-old with a bicycle. I believe there should be some law that children should not have bikes until the child is ten years old. I have a policeman friend who won't let his youngster have a bike because he has seen so much of the danger. I believe every parent-teacher organization should really squawk to their first grade mothers.

MR. STRICKLER: The parents at the Horace Mann school in New York city did not seem to mind when the first and second grade children wanted to ride. They furnished bicycles and gave instruction. It was all done under supervision and was a good thing, I believe.

CHAIRMAN MANN: I believe all of these problems have to be decided on the local level, with the parents deciding whether they want to set certain standards. I don't suppose we can decide here what any of the limitations should be. But I do believe this is a problem for the schools and parents and the police departments to work on together.

LESTER SANDUSKY [Toledo, Ohio]: In Toledo the bicycle problem is a major problem. I am connected with the police department. This year, we have a new program in which we work directly with the schools and the boards of education. We find that bicycles are by far our greatest problem. I believe the only answer is for the state legislatures to set an age limit on bicycles. When a child is riding a bicycle, a police officer is reluctant to enforce traffic laws. The parents must go to the police station when the child's bicycle is impounded in order to get it. If the legislature would pass a law making it legal for children of ten or twelve years of age to ride a bicycle and making the parents responsible, that would answer the problem. But the child himself does not know all the rules. The automobile driver of today, is a good example of lack of training. We have more accidents today than at any time in history.

MEMBER: It seems to me that if we had universal laws, it would be less confusing, not only for the parents but for the child.

CHAIRMAN MANN: I think we all agree that we need uniform traffic regulations.

MEMBER: Let's approach this question from the viewpoint of the child. I have a ten-year-old child who has a bike and I don't allow him to ride on the street. Yet he is not supposed to ride on the sidewalk. I believe we should have places for the young rider, just as we have bridle paths for horseback riders. It is up to the taxpayers to see that we have someplace to ride bicycles.

MILDRED FOWLER [Baltimore, Md.]: The park doesn't help the neighborhood situation when the park is not close to the home. You don't want your child riding a long distance to the park.

I would like to ask one question. What facilities have you in your school to help children overcome some of their so-called disabilities?

DR. BIRNBACH: In our school system, we have school psychologists and we have nurses who are alerted to look for children who might be emotionally unstable or maladjusted. But we really need safety psychologists—someone who can really understand and prescribe some therapeutic information for the child from the safety standpoint.

MISS FOWLER: We can refer these problems, but specialists are so few and cases so many, that we can't get them handled quickly.

DR. BIRNBACH: It becomes every teacher's responsibility and every school nurses's responsibility to bring the matter of accident proneness to the parents' attention. If the parent is interested enough—and most parents are—they can take the child to their own family physician.

OLGA ADAMS [Chicago, Ill.]: I wonder if there is in the over-protected child a proneness to accidents?

DR. BIRNBACH: Unfortunately there are so many factors and combinations of factors that enter into accident causation that it is difficult to point to any one or two factors and say that that is the cause. Each child who is accident prone presents an individual problem. I think it is foolhardy to attempt to set up one set of rules and say that you must do this and you will be cured. Each child has to be treated as a separate case.

MISS ADAMS: It seems that in our school the child who has never been allowed to do anything before he comes to school and has been cautioned and protected until he comes to school is the child that has accidents.

MEMBER: My experience leads me to believe that safety education should be taught to a child early enough so that he attains a sense of responsibility. I have a little girl and I gave her a sidewalk bike at the age of four. I have never had any trouble with her because we have drummed it into her it is her responsibility to the neighborhood, to the drivers and pedestrians and everyone involved to be careful.

CHAIRMAN MANN: I believe it is obvious that we need more specialists and we need more general approaches. We need to know more good points in physical education and we need the advice of specialists and more studies like Dr. Birnbach's. At the same time, I think we have to rely upon the teacher who is working with the child day in and day out to help him live a more wholesome life. The teacher who has the right approach is thinking of everything combined—safety, health, physical education, along with other things. We need all of the advice and assistance we can get. We need to encourage our classroom teachers to be aware of these problems and to think of them from a broad general standpoint.



## Desirable Standards in Driver Education and Training

By MARION R. TRABUE

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The first question that should be raised in discussing this topic is whether any definite standards are desirable in the education and training of automobile drivers. The answer to this question depends, I believe, on the importance attached to the education of drivers. If an activity is relatively simple and unimportant, there is little use in dis-

cussing standards for it. On the other hand, if an activity is complex and vitally important to the health and welfare of the entire community, definite minimum standards should be agreed upon by those who are responsible to the community for conducting that activity.

I doubt whether it is necessary to argue here regarding the importance of definite standards for the competence of automobile drivers. Twenty-five thousand or more automobile drivers are involved in motor vehicle accidents on an average day in this country. Thousands of people are injured and almost a hundred are killed in these daily accidents. Most of these accidents are caused primarily by inefficiency in driving. Almost all citizens of the United States ride in automobiles, and about a third of them actually drive cars. It is not incorrect, therefore, to say that lack of skill and judgment in driving is a matter of vital common concern. The state, as the agency of the people in matters that affect their common welfare, should establish and enforce high standards of competency in licensing the drivers of motor vehicles.

Whether the public schools should provide education and training in the operation of motor vehicles is a question on which there may possibly be some real differences of opinion. Most of those who doubt the necessity of providing such instruction in the public schools do so because of an erroneous understanding of the state's purpose *in paying for education*. There are many people who still have an idea that public funds are used in schools as a sort of gift or charity to children. That is not correct. The state taxes its citizens and supports public schools for definitely selfish reasons: to improve itself, its institutions and its programs.

*The reasoning* behind the use of public funds for education in a democratic state grows out of a clear recognition that the state's government, and program are never perfect—that they are constantly in need of improvements. New conditions are constantly appearing in the modern world, and the state must be alert to their implications for the common welfare. Better solutions to the problems of community living must constantly be sought, and, in a democracy, these solutions have to be worked out and put into operation by the citizens themselves. The democratic state therefore supplies its citizens with education, and even requires that they go to school until a certain age, in order that they will learn to work out better solutions to their problems of common welfare, to improve their government, their institutions and their programs of community action. In paying for education *for all its citizens, the American state is* not being charitable. It is only paying premiums on a gigantic self-improvement insurance policy.

When it is clearly understood that the state's purpose in supplying education is to develop in its citizens efficient habits of co-operating with each other in working out better solutions to the vital problems of their common welfare, the teaching in public schools of efficient habits of automobile operation can no longer be questioned. Safe driving is certainly one of the modern problems that is of vital concern to all Americans. Not only is it a vital problem of the common welfare, but it is also a problem of great personal interest to almost every student at about the time he is attending high school. Very few problems of the common welfare have as great personal *interest to the individual high school student* as learning to be a good driver. Teaching a student to drive a car efficiently and safely is, therefore, an ideal instructional *element* in the total curriculum designed to develop the desired attitudes, knowledge, skills and habits of co-operating with others for the common welfare. No secondary school curriculum today should overlook this unusual opportunity to build the specific characteristics for which the state supports public schools.

*Even though they may* accept driver education and training as a part of the secondary school program, there are people who are not yet convinced that standards should be set up for such instruction. As I understand these people, they do not object to the use of definite standards of performance in the operation of cars, but they do object to the establishment of standards for the qualifications of teachers in this field and of standards for the instructional program employed to develop competent drivers. These people would, if they were consistent in their thinking, approve of such standards of performance in arithmetic as "2 plus 2 equals 4," but they would object to any requirement regarding the qualifications of the elementary-school teacher or with regard to the procedures to be used in teaching pupils that "2 plus 2 equals 4." They would probably argue that so long as pupils give the right answer, "4," it does not matter whether they are taught to count fingers or to use some other device for obtaining the right answer. They would, if consistent, say that the previous experience and training of the teacher was unimportant so long as her pupils learn to say "4."



Anyone who is familiar with the results of instructional research knows that differences in the materials and procedures used in instruction make significant differences in the rapidity, thoroughness, permanence and functional values of learning. *How* one learns does make a real difference in *what* he learns and in how he will use what he learns.

The point of view which I have been presenting here is that driver education and training should be designed to develop, not only the skills and habits of efficient automobile operation, but also definite attitudes of courtesy and helpfulness toward other people and strong habits of co-operating constructively with them in developing better solutions to the problems of their common welfare. The ability to operate a car efficiently or to add two and two correctly are not socially desirable outcomes of public education unless the learner has also acquired the attitudes, understandings and habits that lead him to use his knowledge and skills for the common welfare rather than for purely selfish ends.

If the standards for evaluating the products of driver education include adequate measures of these attitudes, understandings and habits of co-operation, as well as measures of specific driving skills, the need will be less than it would otherwise be for setting up standards for instructional materials and procedures. Somewhere, however, the teacher of automobile operations needs to be made very conscious of the fact that driving skills are not the only outcomes that should be sought in driver education. Every individual, whether he be a student or a teacher, finds it helpful to know exactly what he is expected to accomplish. If the standards for the student are stated entirely in terms of skills and habits in driving, the teacher should have the additional guidance of instructional standards that have already proved most effective in obtaining the broader outcomes of driver education.

*In spite of the probability that some of* you may object to one or more of the standards which my experience leads me to consider desirable in this field of driver education and training, I am going to propose something definite for your consideration. My own experiences have led me to prefer the discussion of specific proposals rather than of general statements which frequently mean different things to different people. Experience has also taught me to listen carefully to objections to my own proposals and to consider seriously any substitute statements and additions that may be proposed by others who have had experiences that differ from mine. The standards I am suggesting are, therefore, not presented as anything more than a tentative basis for further improvement. You should also understand that I have not originated these standards, although I have made some changes in the language in which others have previously stated them.

First, I propose nine standards that seem to me desirable in the planning of a school program for the development of safe drivers. Most of these standards would need only slight changes in wording to make them equally applicable to conservation education, health education, thrift education, or other special phases of citizenship education. What I have tried to do is to state the practices that have usually proved successful in curriculum planning, but to state them in terms of driver education.

### Desirable Standards in Planning a School Program for the Development of Safe Drivers

1. The attitudes and habits of co-operating with other persons that are to be developed through the program should be clearly stated before the activities to be included in the program are planned.
2. The standards of performance behind the wheel that are to be used in judging a driver's efficiency on the road should be clearly stated and fully understood by the teacher and all those who help to plan the program.
3. The items of knowledge and understanding that are to be developed in the student by the driver education program should be listed before the program is organized.

4. In selecting the activities and experiences to be provided for students in the driver education program, preference should be given to those that: (a) have real interest to the student; (b) provide richest opportunities for learning the attitudes, understandings, skills and habits that are to be developed; and (c) provide maximum use of what the student has learned in situations that have real significance to him.
5. The activities and experiences should be arranged in such psychological sequence that the student: (a) will be able to perform his tasks successfully; (b) will be able to recognize that he is making steady progress; and (c) will, as he progresses through the program, be using efficiently the things he has learned in previous activities.
6. Carefully designed tests should be used throughout the program to reveal to the student and to the instructor the current status of the student's attitudes, understandings, skills and habits.

   *Note*—These tests should be closely keyed to the sequence of learning activities in order to reveal the individual student's current needs for further instruction and experience. Students will differ widely in their qualifications at the beginning of the program and will progress through the program at varying rates. Those who learn slowly should not be allowed to retard the normal progress of those who learn more rapidly.
7. The instructional materials provided for the students should be: (a) the most efficient obtainable for each activity; (b) adequate in number; and (c) in perfect operating condition.

   *Note*—Experience has indicated that there are specific instructional values obtainable from textbooks, pamphlets, magazine articles, digests of traffic laws, manuals, motion picture and slide films, wall charts, classrooms equipped with driver's seats and controls, dual-control cars, off-the-street driving ranges, parking-practice ranges, street and highway driving courses, standard cars of various makes, and appropriate equipment for testing special abilities.
8. The program of driver education and [illegible]ing should be open to those students for whom it has greatest immediate interest and value. In most cases this will be just before or at the legal driving age.
9. For the average high school student without previous driving experience, the program should provide one period per day and should extend over an entire school semester. Approximately 40 per cent of the total time should be spent in a car with an instructor. From eight to ten hours of actual behind-the-wheel training should be adequate for the average student who has successfully completed the previous parts of the program.

Standards of performance behind the wheel of an automobile have been proposed by others who are far more competent than I, and I have therefore not attempted to make any further suggestions in that area. My colleague at Pennsylvania State college, Professor Amos E. Neyhart, has published an instrument, with which most of you are familiar, known as the "Road Test in Traffic," distributed by the American Automobile Association. Each type of error made by a driver is given a definite score on this schedule. The better a driver is, therefore, the lower his score on this test. I should be inclined to question whether any student should be given credit for having completed satisfactorily a training program in safe driving until his score on this schedule is below 200. I should also question whether any teacher should be appointed to teach safe driving until his score on this schedule is below 100.

Whether you agree with me on these critical scores or not, it is desirable that definite standards of performance behind the wheel in traffic be set up by those who establish programs of driver education and training. Your local or state school system may be able to develop a better instrument than that distributed by the American Automobile Association, and you may wish to require higher standards of performance than I have suggested. Unless definite standards are established in terms of specific skills and habits in driving, however, students will not obtain the satisfaction from the progressive mastery of driving skills to which they are entitled, and the final results will be less desirable than they should be.

Another area in which I think standards are desirable is that of the qualifications for teaching safe driving. Many teachers should not attempt to teach anyone to drive. In fact, some of the most unsafe drivers I know are high school and college teachers. I have, therefore, proposed some tentative standards which seem to me desirable in this area. I must admit that they are not all as objective and easily administered as they should be. They do indicate, however, some of the characteristics which I think a school should look for in selecting a teacher for its program of driver education and training.

**Desirable Standards for Teachers of Safe Driving Courses**

1. Good health and physical condition, including normal vision, good hearing and no physical disabilities.
2. State certification and at least a year of successful experience as a teacher of adolescents.
3. Even tempered, unselfish, business-like, not easily excited or angered, unusual patience and genuine interest in young people.
4. Strongly developed attitudes and habits of effective co-operation with others in community improvement activities.
5. Superior skills and habits as a driver, demonstrated by high scores on Neyhart's "Road Test in Traffic," or on a similar performance test, and by a record of at least 20,000 miles of safe driving.
6. Thorough knowledge of the important facts and understandings to be taught and of the procedures by which they can be taught most effectively.
7. Genuine enthusiasm for driver education as a means of developing good citizenship and of preventing accidents.
8. Efficiency as a lecturer, demonstrator, discussion leader and organizer of people and activities.
9. Efficiency in the use of tests and other instructional materials and in adapting instruction to the special needs of individual students.
10. At least a two-semester hour course in the Teaching of Safe Driving.

In closing I should like to emphasize again that I have no "pride of authorship" in the standards I have suggested. They have been borrowed in almost every case from other people who have had as much or more experience than I in driver education. They do, however, appeal to me as desirable standards that may be helpful to local schools that are thinking of developing a driver education program.

I am convinced from my own experience that there are few if any other fields of instruction that have a greater appeal to students or a richer opportunity for developing in students the attitudes, understandings and habits of co-operation that are desired by the state when it supplies the funds for public education. In driver education and training we have the opportunity not only to help prevent thousands of unnecessary deaths each year, but also to build in our students the characteristics which will preserve and improve our democratic civilization. For such a task, it seems to me, we should develop definite standards and should continue to raise them higher and higher as we learn more about how to accomplish our task.



## Problems in Maintaining Standards

**(A Symposium)**

*Presiding:* N. O. SCHNEIDER, Director, School & College Div., New Jersey State Safety Council; Chairman, Program Committee, National Driver Education & Training Committee.

*Participants:*

WILLIAM N. COX, JR., Administrative Head, Public Safety Institute, Georgia Institute of Technology, Atlanta, Ga.

LOUISE SMITH, Consultant, Health & Safety Education, State Dept. of Education, Tallahassee, Fla.

BERT L. WOODCOCK, Instructor in Safety Education, Iowa State Teachers College, Cedar Falls, Iowa.

CHAIRMAN SCHNEIDER: The first speaker on this symposium is Mr. William N. Cox, Jr.

MR. COX: The matter of standards has

certainly been very ably presented by Dr. Trabue. I don't think that it is essential that we mention others. I think we should immediately move on to the problems.

I am going to mention just a few problems and comment on one or two. I think that this matter of standards is most important.

Driver training has been largely handled by a relatively small group. Actually we don't have a great number of high schools *even today* doing the job. Those few are pioneers, so to speak, and it has never been necessary to establish standards for pioneers. More often their objectives are well above any standards which we might reasonably establish. But as this activity becomes more general, and as we inevitably entrust it to new leaders, we must establish standards.

In driver training there are problems in connection with teachers, time, equipment, instruction material and testing.

Being so directly connected with engineering, perhaps I know a little bit more about equipment than about some of the other problems.

We naturally divide our needs for equipment and the problems in connection with securing and using this equipment into two areas, that of classroom work and that of field work. In the classroom, our equipment, aside from instructional materials, will include a large variety of aids. I think, perhaps, our main problem has been a tendency on the part of some persons to overemphasize the aids to the exclusion of the *actual teaching materials. Aids should* be well co-ordinated with the study outlines. They should be used at appropriate times, to an appropriate extent. And they do form a most attractive part of the program when so used. Those of us who have time to use the testing devices of all sorts know how valuable they can be, not as a matter of measuring, but of creating enthusiasm; assisting persons to do better; having them realize that perhaps they aren't quite so adept in a particular type of activity as they may have assumed.

Then there is the matter of the car for behind-the-wheel training. We have used, to a great extent, the dual-control car. It is pretty generally conceded that the dual-control car is most desirable.

The matter of obtaining the vehicle has been a problem. Many have come to believe that the sooner we reach the point where the car is owned in much the same manner as any other equipment, such as laboratory equipment and shop equipment, the more safely established our program will become.

But we do not undervalue the possibility of obtaining this training vehicle through gifts, lease or loan.

Perhaps I might comment briefly about the matter of time allotment *for the driver* training course. You have Dr. Trabue's recommendation as to time. I don't believe that varies to any great extent from the recommendations of several other agencies who have occupied a prominent place in the driver training program. I believe our greatest problem in the matter of time is the matter of securing sufficient time for a thorough behind-the-wheel training program.

In the classroom part of the program, the groups can remain well within accepted standards for education and still be many times larger than those that we can accommodate at any one time in the field. For example, we can frequently handle 30 *to* 35 persons in the classroom and do the job well without any compromise on accepted standards. But in behind-the-wheel training, we are limited by the capacity of the car *itself.* I believe it is generally agreed that if we have four students and the instructor in a five passenger car, that is the capacity of the vehicle.

That means that we are very limited, because behind-the-wheel training requires time. So that will be your problem—to take care of this group which you can handle so ably in the classroom but must sub-divide for field work.

MISS SMITH: Psychodrama is a technique about which we are hearing a good deal. At the present time, it is one effective means of solving, or getting to know, some of our problems. Psychodrama is putting yourself in the other person's place.

I'd like you to put yourself in the place of many high school principals. We recognize that there is a great gap in many of the schools of this country between the standards that Dean Trabue recommended and the *things* that are in actual practice. Mr. McFarlin told us about the differences



in the length of time being devoted to driver education and training, and the differences in the persons who are teaching this particular course.

It seems to me that, as we get at the root of some of these problems, one of the key people in the whole picture is the high school principal. He is besieged with requests of many kinds, to put many things into his curriculum—driver education, family living, Americanism, alcohol education and many other things.

He hears about safety over the radio. He reads in his evening paper an editorial on the number of persons who are being killed. Perhaps an accident occurs to one of his own students. And he begins to *think "We really ought to do something* in our school about driver education."

So he decides that he will include safety education in his course of study, and he will select a teacher to be trained.

Too many times that teacher is a person who already has a full load, who may not be too interested in the field of safety and who may not want to teach it. But the teacher goes away and takes the course. He is quite enthusiastic. He has gained interest and information. Then he comes back and reports. And the principal is faced with the practical business of developing a schedule, of financing a program.

How have we been developing this program? We have been taking students out of study halls; sometimes we have been taking them out of other classes; we have been giving them driver education on Saturdays and even on holidays. But, there are other teachers on the staff, and they are equally concerned about that time we are usurping. The music teacher is just as concerned for that extra time as the driver education teacher may be. And the history teacher thinks that study time is quite as important for his subject as is driver training.

So, among the other members of the staff, we have created a problem while working out our own program.

Difficulty in scheduling, lack of adequately prepared teachers, pressure groups and overly enthusiastic nonschool personnel, who see only one phase of a program without viewing the total educational picture, are some of the problems with which we are faced.

Safety education is new in our curriculum. It is in its infancy. We had quite a setback to our driver education and training program during the war and, in our own state, we had no courses in behind-the-wheel driving up to two years ago. We have, at the present time, 59 high schools offering courses in driver education and some 30 of these give behind-the-wheel training.

I wonder if it would be possible in the schools that are training school administrators and high school principals to incorporate some type of training which would give them a more thorough understanding of this program? It has been our experience that when school administrators or principals know the program, how it operates and what *is needed, when they have had* adequate training, they usually become enthusiastic and can find the means to carry it out. We have a great group of in-service administrators. I think we need to reach that group. When we do, I belive that some of our problems will be solved.

When we introduce driver education and training into a school, it is equally important for all staff members to be enthusiastic for the cause.

Last year we investigated whether or not we had any certification requirements in our southern states. There was only one of 17 states interviewed that had any certification *requirements* for teachers of driver education and training. I believe we need a course in driver education and training, but I also believe that we need other courses in safety for the total school personnel.

There are many problems that have to be solved. It isn't a problem that any one group alone can solve, but through co-operative effort I believe we will move forward rapidly.

MR. WOODCOCK: The problem that we have in Iowa is, I am sure, a problem which, if you haven't already had it in your state, you will have, and that is the need for teachers trained in the proper procedures of teaching, not only highway safety, but other phases of safety work and safety education.

When we go out into the state and talk to principals and superintendents, the first thing they say is, "Well, okay, sure safety is a good thing. We'd like to put it in, but how much time do we have to allow it?"

That is their one idea. If they can get something for nothing, without cramping their style, it's a grand thing. But they don't understand the program. They have only been *exposed* to it.

We also found one of our most serious problems has been that our teachers haven't a safety background. We have had short courses for teachers, but we've discovered that you can give only the barest essentials in a short course.

The people we teach in a short course certainly lack much. Our first course, which we insist that everyone take before registering for any other course, is a basic course—what is safety, what is the need for safety. It includes a study of the national, state, and local accident record. A high school teacher should also know all about organizations that are working for safety—what each one has to offer, what each can do, where each can help.

In Iowa we have had a big problem. A year ago, the only cars that were available were certified to the schools by the American Automobile Association.

Last fall other cars were being offered and before long we found we had cars and no certified teachers for them. Of course we trained and certified teachers as quickly as we could.

Together with the department of public instruction, we set up standards. One is, of course, that a teacher be certified. Anyone taking a short course receives a temporary approval good only for one year.

Right now we are planning with our several different automobile associations in Des Moines, to set up an insurance plan and a contract. Certain standards certainly should be set up and some agreement reached.

The number of hours that we should teach behind-the-wheel driving, as well as classroom training are uncertain.

In the matter of equipment, we certainly don't want to forget, as well as dual-control cars, cut-away models and charts. I have found them very valuable.

Put yourself in the place of a beginner. Did you know anything about a clutch? What is transmission? To show students these important parts of a car, you don't need expensive outfits, but certainly you need *something*.

There are wonderful charts on the market and the cut-aways are remarkable. I believe every high school should have a laboratory.

CHAIRMAN SCHNEIDER: We will now open the meeting for discussion and the chairman will entertain questions from the audience.

R. L. BARRICK [Pittsburgh, Pennsylvania]: One of the greatest barriers to the expansion of the driver training course has been the item of cost. I would like to know if there has been any study of any kind or any research which would prove reasonably conclusively that we are doing it as economically as possible, particularly from the standpoint of time.

For instance, has there been any study made or any attempt made to set up a way whereby the various foot and hand coordination could be taught other than actually behind the wheel?

CHAIRMAN SCHNEIDER: From the standpoint of cost there have been studies made. Mr. Danford, will you answer that question?

H. R. DANFORD [New York, N. Y.]: I wish I could answer that question for Mr. Barrick. Sometime ago we conducted a study on per pupil cost of driver education and training in conjunction with the activity of the National Driver Education and Training committee. Those figures are, of course, invalid today. I should say today that, with one teacher teaching full time in a high school, depending upon his salary, of course, the costs range anywhere from 28 to 36 dollars per pupil.

The greatest item, of course, is the teacher's salary. If you can implement or accelerate the learning of the student so far as skill is concerned by some artificial method, such as is used in certain of these set-ups, then, of course, the cost will go down.

There was a study made about 15 years ago as to how much different subjects cost. I found that English costs 36 dollars per pupil. I was trying to compare the cost of the academic subjects with the cost of driver education and training, so that we could have some common basis for comparison and a point of argument. But, strangely enough, I found that most superintendents, who are the first to say driver training costs too much, didn't even know what chemistry costs.



H. JAMES TYSOR [Dallas, Tex.]: In Dallas we are using a combination of the Detroit-Chicago system. We try to use all facilities that we possibly can because I teach, in one semester, more than 250 students.

A. S. LEVENS [Berkeley, California]: I should like to say that this question of cost interests me because it seems to worry many principals and administrators. But, more important, is what does it cost *not* to give safety driver training?

I wonder to what extent the entire high school curricula have been evaluated in the light of present day needs. I'd be interested in learning if there is someone here who can tell me whether curricula have been studied to a point were perhaps we can say a particular course should be dropped or another strengthened.

In California we are making a start, we get the money because driver training is recognized as one of the best investments this country can make today.

WARREN L. DUNCAN [Hackensack, N. J.]: I asked Link of the Link Trainer if he could make anything similar to what he had made for airplane training, something that would give efficient training in momentum and centrifugal force and all the things that are involved in road instruction. He said, "These airplane things cost 10 or 15 thousand."

In trying to get 25 high school principals and 6 parochial schools to follow classroom instruction with road instruction, I am running into difficulty. We have a set up of three cars in use seven periods a day. That handles 21 students a day. Each one goes out 10 times. Is 10 hours in the car worse than nothing?

MR. COX: I would certainly prefer 10 hours to none at all. I think the 10 hours might be supplemented by some of the programs that have been advocated by various groups. I wouldn't be satisfied with 10 hours for very long.

MR. DUNCAN: But you would go ahead with it?

MR. COX: Yes.

MR. DUNCAN: The other question is related. Out of these 21 pupils probably three or four do not have the aptitude for driving. In those cases ten lessons aren't enough. In one particular case, the teacher refused to limit the pupil to 10 hours. He said he wasn't satisfied. So instead of teaching 73 that wanted to take the driving course, he only got around to teaching 30. He insisted on giving the poor pupil additional road instruction that he needed or he wouldn't take responsibility for having trained the students.

Can we afford to do that?

MR. WOODCOCK: We recommend a screening job. We can't take everybody. Two or three of our high schools have. They take everybody, on the assumption that if it's good for one, it's good for all. Certainly it would be good for everybody. We wish we could take everybody. But I operate on this premise. Do a good job with a small group; then get another instructor, or work out another plan, or get another car.

Des Moines, I think, is a good example in our state. Des Moines started out with one instructor who handled two schools the first year. Last year Des Moines put on another instructor to handle two schools. That made two men for four schools. This year Des Moines hired a third man. "Next year," the man who hired all the men said, "I am going to add one man, and I'll add one man every year until I have five men. Then I am going to hire five more. We have two coaches in every school, and we are going to have two highway safety teachers."

I believe we shouldn't quibble about whether we give three, four, five, nine, ten, or twelve hours training. You may do a good job in two hours, if the instructor is on the ball. And maybe after nine hours under the best instructor in the world you won't produce an experienced driver.

CHAIRMAN SCHNEIDER: You are letting Dr. Trabue off too lightly. Nobody seems to challenge the desirability of the standards he has set up.

WILLIAM C. KNOELK [Milwaukee, Wisc.]: We are suffering from oversimplification. We are talking about costs, number of hours, type of cars, and how it should be owned, whether by the board or whether it should be rented.

I take exception to two items that Dr. Trabue stated. He spoke of a carefully de-

signed testing plan. I should like to say that if it is true that the biggest single factor is the development of proper attitudes and emotional controls, and since the biggest factor is to get properly licensed drivers on the road, wherein do we aid licensing of the various states by giving some type of attitude teaching and some type of emotional control teaching? What test is there that could be developed where even a reasonable predictive value could be developed to show what the individual is doing or is going to do from the point of attitudes and emotional control?

DR. TRABUE: I believe, as you do, that we must have more than just skills That is true of the entire school program, not merely of the driver education program. Our teaching of mathematics, our teaching of science, and all the rest of the teaching we do must be looked at from the point of view of its contribution to the individual and his skills and habits and attitudes—of his working with other people to make this a better world in which to live.

Some of you may know that most of my early work in education was in this field of measurements and testing. I was interested in it, because I wanted to be able to individualize instruction. I wanted to be able to help young people to move in the direction in which we think they ought to go. But we have done very little in the development of those measures.

MR. KNOELK: Outside of the New York Center for Safety Education, do you know of any tests that have any predictive value along that line?

DR. TRABUE: There are some that give some indication that is useful, but the difficulty is that it isn't reduced to a simple form such as we have in handwriting or spelling and the like. The ordinary teacher would not be able to interpret it.

MR. KNOELK: You would have to have a psychology laboratory?

DR. TRABUE: That is right.

LEON O. SMITH [Omaha, Neb.]: I would like to address a question to Mr. Woodcock, a question about insurance. I think that is a question that makes a lot of superintendents a bit skittish about putting in driver education because they don't know what to do about insurance.

About a year ago, before we embarked upon the program in Omaha, we wrote to a number of cities, including some in Iowa. Some of them said the state law in Iowa did not permit school boards to take out liability insurance.

MR. WOODCOCK: That's right, they don't permit it.

MR. SMITH: How do you handle it?

MR. WOODCOCK: The school has to give the instructor a bonus for the amount covered in this insurance. The company we use just came up the other day with a new one. The college had been insuring its busses and cars for years. The commissioner told us that if that came up in court, we would never get a nickel because "You can't insure the state, and the state cannot be insured against someone else's actions." So this is the way we handle the school bus insurance —the school board gives somebody a bonus and he takes out insurance and puts an additional underwriter in to cover the school. I am covered and anybody that I let ride in the car is covered, but the school is not.

CHAIRMAN SCHNEIDER: There are only a few states that provide in case the teacher is sued for liability that the state will compensate the teacher in case damages are recommended by a jury. I know of two —New York and New Jersey.

MEMBER: California and Oregon.

MR. SMITH: In our case, we circumvent that by taking the matter up with the Omaha Safety Council and taking a blanket policy for the five cars.

CHAIRMAN SCHNEIDER: But the school boards are not responsible?

MR. SMITH: No.

A. E. FLORIO [Urbana, Illinois]: Maybe Mr. Woodcock will answer this. One of the desirable standards was that the teacher must be certified and have at least a year of successful experience as a teacher of adolescents. Does that mean that we must ignore our junior and senior students who have a desire to go into this field on the teacher education level?

MR. WOODCOCK: That was the Dean's statement on the year's experience. I don't feel that that is quite necessary. However, I don't have the rich experience that he has, so I shouldn't answer for him. But in our experience we turn them right out of our college graduating class with certificates, and they become very successful teachers.

I can give you many examples in the state of Iowa. If a man or woman goes through four years of teacher training and has had practice teaching, he or she should be a successful teacher.

I'll tell you what I did just last spring. I recommended that a man not be hired by one of our larger towns. He had only had one course under me, but he had had that in safety. So he said he was trained in safety. The superintendent hired him. The superintendents will do just about as they please unless we have certain standards.

MEMBER: *Apropos* the question of the year's experience, I would much prefer that the person have two, three or four years' successful driving experience. One of the worst teachers I ever had was a man that had 15 years experience teaching industrial art; and one of the best I ever had was a girl I had to use during the war who was a sophomore in high school. Believe it or not, she taught at the college and she did a good job, but she had had a lot of experience in driving.

BAYARD A. CLARK [Detroit, Michigan]: My question has to do with the statement made here sometime ago by Mr. Woodcock during his talk regarding temporary certificates. May I ask the question whether or not these temporary certificates are issued to anyone other than a member of the teaching profession? Police officers, for example?

MR. WOODCOCK: Not in our college.

CHAIRMAN SCHNEIDER: One of the basic requirements that Mr. Woodcock stressed was that the individual be certificated as a teacher and that, if he were temporarily certified, it would be only for a limited time and he would have to be upgraded after a certain period. What was it, one year?

MR. WOODCOCK: He would have to go back and get some additional college hours.

CHAIRMAN SCHNEIDER: Any other questions?

MR. WOODCOCK: Excuse me a minute. I think the type of individual just mentioned, that has been trained by experience, may be successful. Dubuque has hired city bus drivers, Greyhound bus drivers and police officers. They have done a very creditable job. In our schools we can't do that.

CHAIRMAN SCHNEIDER: We stand adjourned.



## What Contributions Can Various Departments Make to the Over-All Safety Program of the High School?

(Symposium)

*Discussion Leader:* ROY C. BRYAN, Director, Campus Elementary & Secondary Schools, Western Michigan College of Education, Kalamazoo, Mich.; General Chairman, Secondary School Committee, N.S.C.

*Participants:*

**Administration**
J. HARRY ADAMS, Superintendent of Schools, Elizabeth, N. J.

**Health Education**
LOUISE SMITH, Consultant, Health & Safety Education, State Department of Education, Tallahassee, Fla.

**Homemaking Education**
MARY E. MARK, Director, Division of Home Economics, Chicago Public Schools

**Industrial Arts**
CLARENCE BATEMAN, Instructor, West High School, Columbus, Ohio

**Physical Education**
RUTH EVANS, Assistant Supervisor of Health, Physical Education and Safety, Public Schools, Springfield, Mass.; President, American Association for Health, Physical Education & Recreation

**School Clubs**
GERALD M. VAN POOL, Director of Student Activities, National Association of Secondary School Principals, N.E.A., Washington, D. C.

**Science**
ROLAND SIMONDS, Director of Safety, New Trier High School

DR. BRYAN: What contributions can the various departments make to the overall safety program of the high school?

We have represented on the panel the following areas—administration, health education, homemaking education, industrial arts, physical education, school clubs and social studies.

We don't propose to stress here the matter of driver education, an important part of a total program, because it is being emphasized elsewhere.

The members of the panel will take about five minutes each, starting with Mr. Adams, to tell us briefly the contributions that the departments they represent should make to a total program of safety in the school.

### Administration

MR. ADAMS: Administration today in a city school system is so crowded with problems and demands for various kinds of programs which cry for attention in the schools, curriculum revisions, public relations, problems of finance, problems of every nature, that unless someone in the organization of the school is vitally interested in safety education and keeps that vital interest constantly before the administrator, he is likely to give only lip service to safety education.

So I believe my first suggestion is to the people who are interested in and who see the tremendous importance of proper progress in safety. Pound at administration to get the facilities, the budget funds and the personnel needed to implement a good program. I believe most administrators are conscious of the need for a good safety program, but the administrator, in general, I believe, tends to think of the safety education program in terms of negatives. He wants to be sure the physical facilities appear to be safe, then he believes his responsibility has been discharged.

We know that that isn't the case. We know we need a positive program to make pupils and teachers safety-conscious.

Another problem is that of motivating and interesting other administrative personnel. There is today a wide variety of administrative personnel in the school systems. Bringing them together in a formal organization to face the problems of safety education is a major problem.

The third problem, I believe, is the secondary school safety program—developing active safety councils to motivate, coordinate, and publicize the safety program. I should like to suggest wide participation by pupils, teachers and administrators. Councils with regularly scheduled meetings and with regular agendas will accomplish much for safety education.

A fourth problem is that of co-ordination with outside agencies—chambers of commerce, local safety councils, safety committees, industrial safety directors and personnel directors. The problem of coordination is an area in which the administrator can make a great contribution. For instance, school administrators should be members of local safety councils and should take an active part in the work.

The administrator can also be of great assistance in the organization and development of a strong audio-visual aids or multisensory aids safety program. Administration can be helpful, can make funds and personnel available to get visual aids materials and place them where they will be used.

The administration should act to procure safe transportation and care for handicapped and crippled children. In many communities today proper transportation isn't provided; proper facilities, proper safety measures are not taken in the school or on the school grounds, to protect these handicapped children.

Another contribution of the administration, one that needs attention, is in the procurement of adequate playgrounds and athletic facilities. There is hardly a city that I know of where there are adequate playground and athletic facilities for high schools, to say nothing of elementary schools. The schools, particularly in the eastern section of the country, are on sites entirely too small. The sites are not properly protected.

Another special area that the administrator can be helpful in is encouraging insurance for athletic teams—for all participants in athletics or sports.

Another one of the problems that I'd like to mention is the help that administration can give in securing adequate police protection at school crossings.

I'd like to just mention behind-the-wheel driving. Many laymen feel that teaching driving is the responsibility of parents. If the administrator is interested and if he sees the value of behind-the-wheel driving, I believe he can prove that the cost need not exceed the cost of instruction in many other fields.

Finally, the problem of bicycle safety seems to me to be in need of great emphasis. I believe we need to incorporate that phase of safety throughout the curriculum.

A good safety education program costs money. Before an administrator will go to the board of education or superintendent and insist on money for an effective safety program, you have to get across to him what safety education can do in the development of proper attitudes and the making of good citizens.



### Health Education

MISS SMITH: There have been several significant occurrences that have brought to my attention the close relationship between health education and safety education. I'd like briefly to mention a few.

There has been a research study made by Dr. Sidney B. Birnbach at the Center for Safety Education at New York university. It concerned a study of accident-repeater and accident-free pupils. He discovered that accidents were much more common among maladjusted children. He also discovered that accidents were more common among children who had visual, hearing and orthopedic defects; that the greatest factor was lack of information. Accident repeaters had less information than accident-free pupils.

If we accept the belief that health is concerned with the physical, mental, emotional and social development of children, then I believe these findings are very significant.

We have long recognized that the main problem in our accident situation is the individual. We have had improved highways; cars that represent the finest engineering skill in the country; but still accidents mount. We have realized for some time that such physical conditions as fatigue, drowsiness, defective sensory organs, chronic illness and age are factors which markedly influence the accident situation. We have known that mental and emotional factors, certain personality patterns, were basic causes in accidents.

This study by Dr. Birnbach indicated that many accident repeaters came from broken homes.

Dr. Gordon from Harvard university has talked about the epidemiological approach to accident problems. He felt that sometimes our work had not been getting at the heart of the problem and that there was a causative agent—a host and an environmental condition that, taken together, produced an accident. We as a group need to take an epidemiological approach to this accident problem.

Dr. Alexander, a noted psychiatrist, spoke of certain personality patterns that tended to produce accidents. He said that basically, at the root of many of these problems, there were personality factors that produced many of the accidents we have.

In Florida we have just recently added to our curriculum a course in health and safety education. That course will deal with a number of problems—mental hygiene; preparation for marriage, safety education including driver education and training. In Florida we have a great deal of hunting, so we are including something on firearms safety. Because we are surrounded by water, we include water safety. We are also dealing with the problem of home safety and first aid.

At the present time, we do not have teachers adequately prepared to handle this course, but we are gradually setting up a curriculum in the state universities which will train and prepare our teachers.

We hope soon to attack successfully our basic problems of maladjustment, of physical defects and of lack of knowledge which Dr. Birnbach's recent research indicates are causative factors in accidents.

### Homemaking Education

MISS MARK: Those of us in the field of home economics have always included safety education as an integral part of homemaking education. Our biggest concern is that we reach only a small portion of the students enrolled in a high school. Our job is to enlighten those students with whom we do have contact so that they have an understanding of the safety problems at home and at school.

In the home economics department we have a particular interest in sanitation, in care of food, in the preparation of food, in the handling of waste and so on. Sanita-

tion in the bathroom is of great concern to a teacher of home management. No place else, other than in a health class, is that particular phase of sanitation emphasized.

Personal hygiene is the concern of home economics teachers, particularly in the unit on home nursing. Care of the bruised, wounded and of the sick in the home is included.

Another particular item with which we are concerned is accident prevention as it applies to the home. We are particularly concerned with accident prevention in the kitchen, in the bathroom, in home dry cleaning, and in the use of electric appliances. We are concerned with child care and the safety angle involved.

We are concerned with the careful arrangement and correct storage of items, at home and in school.

In the clothing laboratory we are concerned with the question of proper clothing for any job or activity.

There are thousands of items, and I think we might mention—the matter of screens being fastened securely; the use of nonflammable wastebaskets throughout the school, as well as in the home; the use and disposal of matches; the arrangement of furniture, particularly around windows; window ledges kept free of articles which might drop to the outside, etc.

The home economics teacher is in a unique position to give religious, spiritual guidance. If we can have these future homemakers develop a conscious understanding of what part the spiritual angle or aspect plays in our safekeeping, I think we have made a real contribution. Perhaps only in one other department, in the social studies, is such opportunity offered.

The home economics teacher can do all this by participating in all school safety activities—in assembly programs, preparing skits which show the type of safety lesson learned in the home economics laboratories.

### Industrial Arts

MR. BATEMAN: If the teacher of industrial arts wishes to survive, he must teach safety. The teacher of academic subjects deals with facts and figures and informational material, mainly, but the industrial arts teacher must add to this machines, tools and materials.

One of the first duties of a shop teacher is to convince his students that they must be safety conscious, that they must be on the alert, that there can be absolutely no tolerance of such things as horseplay in a school shop.

I believe that the large majority of shop teachers believe in a policy and a philosophy of safety. I'd like to tell you very briefly what is being done in the State of Ohio to aid the teacher of industrial arts in the teaching of safety.

About a year ago we called together a committee of representative educators, two or three safety engineers from industry, a city superintendent, a city director of industrial arts, and certain teachers of vocational agriculture. We are working on a program which will include three specific objectives. The first one is to develop a uniform accident report form. We believe that in order to interpret what is happening throughout the state in the shops, we need to have some uniform report.

Suppose a playground supervisor reported that a child was in an accident because a swing broke. A good report form would show exactly why that swing broke. It might be that the pin which fastens the chain to the frame could have been so worn that it was weakened and the swing broke. From such report, we can analyze the accident so that we will know how to prevent it happening again. We will learn what to inspect and how to eliminate hazards.

The second thing this committee is attempting to do is to develop a uniform shop inspection form. We feel that a good inspection form would act as a check list, something that we could hand over to every teacher and that he could use to check his own shop, his own equipment, to see whether or not his shop and equipment measure up to standard.

The third thing that we are trying to do is something that will help the administrator, the supervisor and the principal. We are trying to develop a very definite set of regulations and safety instructions. We want to have a set of instruction sheets that an administrator can hand to any shop teacher.

I believe if I were a supervisor, I would ask every teacher to measure up to certain minimum requirements of safety. It is so easy to overlook certain things necessary to the teaching of the proper use of any power equipment.

We hope to give the shop teacher very definite things to check. Let's take the wood turning lathe for instance. One of the things that would be listed is that the tool rest must be always at least a quarter of an inch from the piece of material being turned. If it is farther than that, the tool may be pulled out of the operator's hands, causing a serious accident.

Let's look at another example, the jointer. A part of safety instruction would be never to put a piece of stock that is shorter than ten or twelve inches on the jointer. I once had a boy who took a small piece of material from the bench where he was working, he went over to the jointer and as soon as that piece of stock came in contact with the blade, it was jerked out of his hand and thrown across the room, through a window. Fortunately his action did not result in an accident. Here is a case of the human element entering into the accident situation.

We believe that a discussion of safety education should be given at least once a month to every class.

I'd like to call your attention to two cases where safety teaching in industrial arts carried over into later practice. A father of one of my students came into the shop and said, "I am now the superintendent of a large sash and door company. I find that I teach my men the same principles of safety that I was taught here in school. I remember very well what you drilled into us."

And one day I took my car into a garage operated by two brothers who had been in our school 15 years before. One of the brothers said to me, "I don't remember what projects I did in your shop. I don't know that I have any of them now. But I certainly do remember the safety instruction you gave, and I remember it to such an extent that I feel perfectly safe now in approaching most any type of woodworking machine, using it properly and safely."

So I maintain that the teacher of industrial arts can and is developing an attitude of safety consciousness in his students that carries over into later activities.



### Physical Education

MISS EVANS: You have had plenty of evidence that the various areas in education all contribute to the total program of safety in the high schools.

What are the aspects of the broad program of safety to which physical education may contribute? May I make just these few suggestions?

First, I believe that physical education on the high school level can easily contribute to safe living, to sensible living in out-of-school activities, by providing facts and instructions in safe conduct in these activities without labeling them "safe conduct." Summer activities, the water front, swimming, boating, other recreational activities, hunting, winter sports, fishing, all are related to the field of physical education.

The field of public safety—traffic and driver education is a part of this big program of general education. I believe that driver education and instruction and public safety are a part of what we should do in the field of physical education.

Physical education should provide safety instruction in school activities, in the use of gymnasium apparatus, sanitation in the showerroom, the teaching of proper attitudes of sportsmanship and fair play.

The physical education teacher should take no chances with broken apparatus. The teacher should inspect all facilities to be certain they are in good shape; select activities that are reasonably safe; teach correct performance; and watch for hazards. Small gymnasia, small playgrounds, small playrooms, large classes, crowded locker rooms, all bring about hazards; to overcome these hazards our boys and girls must be instructed in safe procedure.

### School Clubs

MR. VAN POOL: I don't believe that young people are primarily interested in safety education as such. I believe we have to create interest by glamorizing safety.

My work primarily is with student activity clubs and student councils. I don't believe that students are crying for information on how to be good citizens. I don't believe they are crying for information on how to be safe. People, young people especially, are adventurous. They like to show off. All they see is the fun, the glamor and excitement.

You have to instill safety in them. You have to make safety education interesting, so that it has a certain air of adventure, so that it seems important and glamorous.

I suggest, as one of the means of doing this, that we put the safety activities in the school through the student council. Many schools have different types of student organizations and they are called by many different names, but the council is widely known. Many schools have a safety *council* which is a committee of the student council. Whether you have a safety club, or a safety commission, or a safety committee, or whatever you want to call it, I suggest that it be placed under the jurisdiction of the student council.

The council is an organization of students elected by students. Such an organization can co-ordinate the various activities of the school, safety activities included.

One of the best contributions which the student council can make is to attempt to create a state of mind in the students, a willingness and desire to do the things they ought to do. The student in the high school is going to do his best work *in safety if* he is convinced that he is right. If the council will teach the students to do what is right and safe, then they will do it because they want to do it. I call this a state of mind.

The council can do two things. It can help through its many activities to create that state of mind; and it can help to carry out the safe activities.

The student council is the leading organization of any school and can help to create the proper state of mind in students so that they will want to do what they ought to do in this matter of safety.

### Science

MR. SIMONDS: At the start of last year I sent a questionnaire around to my teachers asking them what safety they taught. There was nothing to indicate they *should* teach any safety. I found that a lot of teachers started to think about safety, about where they could teach safety in the program. That stimulated discussion which has been helpful.

The athletic department noticed that students in crossing the streets to one of the fields were subjected to danger from passing cars. The teachers mentioned this to me and I arranged with the police to have a section of the street blocked off during certain hours.

If we had someone whose responsibility it was to look out for safety, there would be a clearing house to which all matters of safety could be referred.

Recently I spoke to the superintendent about a new building program that is being started. I reminded him that it would be a good idea to *install* safety glass. He made a note of it, and that will probably be done.

At the start of the year, we have an assembly to acquaint new students with the traffic regulations around the school and with the procedures to be followed in case anyone is in any kind of an accident at the school.

The administrator may be interested in safety but he can't be expected to do all the work himself. I believe every school should have someone whose job it is to promote safe practices and to encourage and co-ordinate the activities of those organizations that are doing safety work.

CHAIRMAN BRYAN: Let us now have questions.

L. T. JOHNSON [Austin, Texas]: Talking about marshaling the forces for a complete safety program in high school, industry has found that about 20 per cent of their workers cause about 80 per cent of the accidents. We ignore too much the personal factor in accidents. Where does the school counselor come in? Isn't it possible that he might make a contribution by individual case analysis?

MISS SMITH: There ought to be some contribution through your health service program.

MACO WHITTALL [Louisville, Ky.]: I want to ask Mr. Van Pool and the other gentlemen if their safety committee of the student council has its own advisors or does the student council advisor carry the whole burden of the student council work and the safety work?

MR. VAN POOL: The student council advisor or sponsor is responsible for all activities of the council. There is no reason, however, why someone else can't be appointed to take over any one phase of the work.



NATHANIEL O. SCHNEIDER [Newark, New Jersey]: We should have a core curriculum where we would teach general safety. Certainly we wouldn't teach physical education safety in a core curriculum or industrial arts safety is a core curriculum. There are certain areas where specific learning in safety should be developed. Certainly a teacher in industrial arts would not be qualified to teach safety unless he taught safety in his own program. That applies to home economics and physical education.

We need co-ordination in safety teaching on the high school level. We still stress too much subject matter teaching instead of teaching the entire program.

You have a splendid safety program on the elementary level. If we could co-ordinate our programs on the high school level, we could probably develop our safety program more satisfactorily. I believe the answer is to form a committee of teachers, list what the things are that ought to be taught and what the responsibilities are on a secondary level.

VIRGINIA WHEELER [Louisville, Kentucky]: Many of our elementary schools have excellent safety programs. I wonder how much elementary school training is carried over into the high school? It seems to me that the students that have had good elementary training develop good safety programs in the high school.

MR. ADAMS: The elementary school program tends to terminate at the sixth grade. The secondary school begins to compartmentalize. Then we lose much of the headway that has been made.

HAROLD S. DIXON [Maywood, Ill.]: I would like to ask what you think of a student court? I have never tried it, and I don't know much about it. I'd like to have some recommendations.

CHAIRMAN BRYAN: I believe most administrators would agree with me that there are certain limitations on this procedure of giving some students disciplinary action over others.

MR. SIMONDS: We had a panel of student leaders in the student council to whom we referred cases. We found that once a court comes into the picture, there are antagonisms between the offenders and the judges.

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## What Contributions Can Various Student Organizations Make to the Over-All Safety Program of the High School?

(Panel Discussion)

*Discussion Leader:* GERALD M. VAN POOL, Director of Student Activities, National Association of Secondary School Principles, N. E. A., Washington, D. C.

MR. VAN POOL: I was at a citizenship conference in Washington this spring which was sponsored jointly by the NEA and the office of the attorney general. At that time there were probably only half a dozen students present and a number of us wondered why it was that, at a meeting in which we were trying to develop citizenship, there were so few students present. One complaint and one criticism that I have of many national meetings is that we are trying to do things *to* students instead of *with* students.

One of the best things that was done at the citizenship conference was a decision that at future conferences they would unite representatives from a number of student organizations.

We are going to start with traffic controls and Tom Chibbas from Lane High is going to start us out.

TOM CHIBBAS: The traffic engineers make up one of the most important organizations in the school. In the summer, as school finishes, Mr. Moore, our traffic engineer coach, lines up how everything is going to start next semester. The boys are on duty at 7:30 every morning, and they stay there for about five minutes after school has started. In other words, they

are at their traffic posts for 35 minutes. There is a second shift at Lane. That shift starts at 8:45. The traffic boys are on duty on that shift from 8:20 to 8:55. The traffic engineers are on duty again at 2:35.

At Lane Tech there are two main thoroughfares. There is Western avenue which is a streetcar line, the longest in the world, and there is Addison street, on which there is a bus line. Most of the students coming to Lane Tech come in at a quarter to eight. There are about 4,500 students at Lane. That means about 3,000 students try to get into school in about five minutes. Everyone is in a hurry. But since we have had traffic engineers, there has not been one accident to the students while going to school.

There have been accidents, of course, but these have been when there have not been traffic engineers present.

On dark days, the traffic engineers wave red lanterns. On rainy days, they wear yellow raincoats.

MR. VAN POOL: The second topic deals with what the students can do in the cafeteria. John Lenessi.

JOHN LENESSI: Lane Tech, as you know, has about 4,500 students. We have three lunch periods. That means that we have a little more than 1,000 students in the cafeteria at one time.

We depend on the students themselves to work in the lunch room.

We have an organization called the hall guards. They are on duty in the cafeteria every lunch period. I'd say we have about 20 hall guards or monitors taking care of 1,000 students.

Students are not allowed to take their lunches outside of the lunch room. If they bring a lunch to school with them, they are required to eat it in the lunch room. That is for sanitary reasons. We don't want any lunches or any garbage left around outside the school or in the halls.

The students that eat in the cafeteria are required to take their trays and clear away their food. It is a cafeteria type lunch. They serve themselves and they clear up their own mess. It is really run very well.

MR. VAN POOL: We will hear more from you later. Now, the work of the corridor monitors by Eddie Dillon.

EDDIE DILLON: The corridor monitors are hall guards, too. They control the halls, to make sure they are kept clean and to make sure that traffic doesn't move too fast. They see that students keep to the right and that they are not rowdy. They keep order and see that there is no horseplay in the halls. They keep the vestibules and the doors clear for safety's sake. The fire department doesn't want loiterers in the vestibules and the hall guards keep them clear.

MR. VAN POOL: Now, science clubs, camera clubs and, in fact, clubs in general. Ruth Delich from Kelly.

RUTH DELICH: At Kelly High school we have 61 different organizations. They are special interest and hobby clubs.

The Electrician's club at Kelly makes sure that all the lighting at dances is correct and that the wires are insulated and that the public address system in the auditorium is in working condition.

The Camera club takes pictures of anything pertaining to safety. The *Clarion*, our school newspaper, publishes pictures and promotes safety.

The Life Saving club is part of our accident prevention program.

The Cleanup club, that's the club of which I am vice-president, keeps order at Kelly. We clear rubbish and anything that might get in the way of students in case of a fire or emergency. This cleanup club meets twice a week.

MR. VAN POOL: I am very glad to see so many people co-ordinating their safety activities with the student council. The student council co-ordinates almost all of the extra curricular activities. That leads us right into a discussion of the student council in general by Marion Yuski, who is also from Kelly.

MARION YUSKI: The student council at Kelly consists of representatives from each of the division rooms. The representatives meet every Friday at first period. During this meeting we discuss many laws that we would like to have put into effect at our school. Some of these laws have been put into effect by our safety council.

The safety council of the student council gathers information and presents it to the student council. These students go over the laws and if they think them fit, they instruct the student body. Some of this information consists of safety circulars, safety surveys and other projects. The perseverance of the student council in presenting this information to the students enables every student at Kelly to be more aware of, and enables them to understand and combat problems.



Representatives are spokesmen for their divisions. They represent from 30 to 40 students. Division period is one of the most important times at Kelly for this is when students are informed of new laws or of new activities. If the students as a whole have anything to add, or would like anything improved, they tell their student council representatives and the representatives refer it back to the student council. The council then reviews the suggestions. When these suggestions are acted upon, rules are drawn up and are presented to the student body. The student body co-operates with the student council.

The health of the individual is very important. Our teachers and our fellow students watch each other. If there are contagious diseases, or if a student or teacher shows symptoms, a doctor is consulted.

In case a student is taken ill at school, he is sent home or is put someplace where he can rest until able to leave.

MR. VAN POOL: The next speaker has a sort of catch-all topic. He is going to talk about auto clubs, driving, supervision of parking and the general workings of the safety committees. Peter Leahy from Lane.

PETER LEAHY: The safety committees at Lane are organized by the students. They are usually made up of members—one from each year group in the school.

We organized the safety men in all the shops at Lane. Since Lane is a technical high school, and since there is a lot of machinery involved, safety training in shop classes is important: Machinery is dangerous if not handled correctly. One student is picked from every shop class. They meet about three times per year or per semester. They inform other students in their classes how to keep free from accidents.

The driving class is an indoor class for the first ten weeks. It consists of two shop periods. The first period is devoted to the laws and regulations pertaining to the driving and handling of an automobile, and the last half is given over to the operation of an automobile. When this classroom work is finished, the student gets outdoor driving in real automobiles.

There is a fenced-in driving course that is one-eighth mile long. We have sedan type cars. They are regulation cars with gearshift, clutch and all the other controls.

These stickers I have here are given to all students of Lane who have proven themselves satisfactory drivers. They must have the vehicular sticker given at the Chicago Safety Lane to prove that the car is safe. They must drive their car no faster than ten miles an hour inside the parking lot when going to or from school. This card is carried in the wallet to show that the driver has obeyed the regulations.

So far as the parking program is concerned, the roving patrol, which is a part of the hall guards, is on the campus most of the time, especially during the lunch period, to make sure that everyone is off the parking lot except those who own cars. This is to prevent theft or tampering with cars.

I believe that the council is doing a pretty good job in organizing these safety committees. I think that the committees are trying very hard, especially in the shops, to eliminate accidents.

MR. VAN POOL: Will those materials be available for people to look at after the meeting, Peter?

PETER LEAHY: Yes sir.

MR. VAN POOL: Next we have a young gentleman who also has agreed to take two or three topics, in one—the work of the ushers at athletic events; the work of the fire brigade and the work of the bicycle clubs. Hugo Schmidt from Kelly.

HUGO SCHMIDT: At Kelly High school, we have an usher staff which is sponsored by the R.O.T.C. During all assemblies they are on posts helping the students into their seats, guiding the classes, making sure everyone is seated, keeping aisles clear, keeping the vestibule clear, and helping evacuate the auditorium. In our auditorium we have routed channels which lead the students back to their next classes. For fire drills we have special channels through which we evacuate the building quickly and promptly without interferring with classes passing through the halls.

At all athletic contests, the usher staff is on duty.

The fire brigade, we call them fire guards at Kelly, are groups of students who, at the first ring of the fire alarm bell, go directly out of their rooms to designated posts at entrances and in the halls. They hold doors open. They assist in emergencies. They make sure everyone is out of the building.

At Kelly we have fire drills once a month.

At Kelly we have no bicycle club but there are lots of students who live quite far from school who do have bicycles, motor scooters and motor bikes. We have bike stands and places to park cars. Each student who brings a car or motor scooter must bring a note to the principal giving permission of the guardian or parent, saying he has the right to bring the car. The student must park his car or scooter for the day in the morning. He must not take it out for lunch period or sit in it during lunch period. He must park it in the morning and leave it there until he goes home at night.

MR. VAN POOL: Our last speaker is a boy who comes from an elementary school where they are just starting a safety program. He is going to give us a summary of what he thinks his school is going to do and what plans are in the making. Bob Loz from Assumption School, Chicago.

BOB LOZ: I'd like to tell you what we have already done. We have 45 patrol boys. We cover seven corners every day.

Around the school we have a square formed by very heavily travelled intersections. We are bounded by California, Blue Island, Cermak and Kedzie which form a square. We have been trying to spread our patrol duty to bring down the accident toll. We haven't had one so far this year.

We have no hall monitors yet, but in the future we hope to have at least 20 to 30 hall monitors. The school isn't very big. We have only about 400 children. We are going to start accident prevention units in every grade from the first grade through the eighth.

Last year we had accident prevention books. Those that finished with an average of 80 or better got cards as members of the American Junior Red Cross Safety Council.

TOM CHIBBAS: I'd like to know what other schools do.

MARION YUSKI: We have no outside patrols, but we have hall guards. These hall guards are stationed several on a floor, in case of emergency and to clear the halls. They may be used as messengers, and may be summoned to go to an appointed place, such as medical room, fire box, main office or telephone outlet.

We have some rules I'd like to tell you about.

1. No linking of arms.
2. No loitering in halls between classes.
3. No stopping on stairs. Keep moving.
4. No slamming of lockers.
5. Keep to the right at all times.
6. No running in halls.

These laws are enforced by faculty and hall guards for the protection of all students. With the co-operation of all persons within a building our corridors are very safe.

HUGO SCHMIDT: Tom was saying that at Lane they have great masses of people coming out of school at one time, all wanting to get on streetcars. At Kelly we have a different problem. We have two lines of transportation—California and Archer avenues which have busses. We stagger our program. First period starts at 8:15 and second period at 9 and some students start at the third period which isn't until 9:45.

They get out at different times, some get out at seventh period—1:40, some at eighth —2:10, and some at ninth—3 o'clock.

With the staggered program there isn't such a problem getting to and from school.

PETER LEAHY: At Lane there are two dismissal times—we have the early and the late shift. The early shift starts at 8 o'clock and the late at 8:45; but still there are large numbers coming out of school at the same time.

HUGO SCHMIDT: Kelly has only 1,800 students and Lane has 4,500 and yet we have three periods to your two, so our problem isn't as bad as yours.

TOM CHIBBAS: It is true that we have only two shifts and our second shift consists of only a few students. The majority are on the first shift.

LESTER SANDUSKY [Toledo, Ohio]: A speaker referred to traffic engineers. Are your traffic engineers graduate school patrols? In other words, the boys that used to do school patrol, are they classified as traffic engineers?



TOM CHIBBAS: They are, only on a higher level. There are patrol officers. For instance, there is a policeman at Cornelia avenue. That's a dead-end street. There are streetcar islands where our students load and unload. Our traffic engineers have the right to stop automobile traffic when the policeman blows his whistle. Patrols in grammar schools have no right to stop automobiles. There is a law against that. But at our school the policeman supervises the traffic engineers. In grammar school the patrols only hold back children until there is a break in traffic; in high school the traffic engineers stop traffic to allow students to cross.

MR. SANDUSKY: You mean your engineers control traffic?

TOM CHIBBAS: That's right.

MR. SANDUSKY: They don't control pedestrians?

TOM CHIBBAS: They control pedestrians, of course; but they stop traffic too when the policeman blows his whistle.

MR. VAN POOL: The students can stop cars legally?

TOM CHIBBAS: As far as I know.

BARBARA A. HAWKINS [Chicago, Ill.]: The boys do stop traffic. I have seen them at Lane, but there is always a patrolman on duty and the patrolman blows the whistle and the boys assist him. They act very much as the regular safety patrol in elementary schools.

MR. SANDUSKY: Their duties are along the same line?

MISS HAWKINS: Yes.

MR. SANDUSKY: I was trying to find out the reaction of the rest of the public to the boys that are classified as traffic engineers. Do the students and drivers respect or obey traffic engineers?

MISS HAWKINS: Yes.

LONNIE GILLILAND [Oklahoma City]: How are violators disciplined?

JOHN LENESSI: At Lane we have an organization of the student council which is called a student court. Any violator is brought before the student court. The student court is made up of a board of students, seniors, representatives from every class. The court hears a case and renders judgment.

MR. GILLILAND: What penalty is imposed?

JOHN LENESSI: A violator is required to stay after school. If he works after school, he is required to come at 7 o'clock in the morning. He is sentenced to a number of penalty periods, depending on the severity of his offense. If an offender comes before the board too often during a semester, he may even be expelled.

MR. GILLILAND: Suppose the parent refuses to allow the child to be penalized, what do you do with the case? What is the reaction of the parents?

JOHN LENESSI: I don't believe we have ever had a case where the parents have objected to disciplinary action.

PAUL MERRILL [Los Alamos, New Mexico]: What is the attitude of the students toward disciplining by fellow students? Do you ever have any cases where there is resentment?

JOHN LENESSI: We very seldom do. We may have a case where the student believes he has been treated unfairly, but most students have great respect for the student court and the student council.

MR. VAN POOL: Let us pass on to the next item. How about the cafeteria committees?

I. L. SWANCUTT [Wauwatosa, Wisconsin]: How do you get volunteers?

RUTH DELICH: At Kelly High school we have a service system and each student that participates in any service club is given a number of civic award points; at the end of four years he is given a letter K. This is quite an honor at our school.

PETER LEAHY: At Lane we have lunch tickets. If the hall guard works in the cafeteria, he gets a lunch ticket which entitles him to a lunch without paying for it.

ALFRED D. FLORENCE [Toledo, Ohio]: Are the children assigned to any certain tables and groups or do they just come in and sit down anywhere?

MARION YUSKI: At Kelly they sit down anyplace.

HUGO SCHMIDT: We have a faculty member that is always on duty in the lunch room. We have a different faculty member every period and they keep order. It also is the job of the faculty member to see

that students don't pull up chairs from other tables and overcrowd one.

MR. VAN POOL: Is that because of *congestion in the aisles?*

HUGO SCHMIDT: Yes.

JOHN LENESSI: The same system is used at Lane. I believe the main reason is the fire ordinance which requires that there be no obstruction of aisles.

MATT DILLON [Oak Park, Illinois]: At Oak Park Township High school, we have a system that we found very satisfactory. We have tables that seat six persons. At the beginning of the year students reserve their tables. There must be six persons at a table. Each student signs up that he will aways eat at a certain table. One person is appointed head of the table and that person is responsible for cleaning it up.

MR. VAN POOL: We don't want to get too far away from the main theme which is safety and the teaching of safety. We are getting into a discussion of lunchroom practices which are interesting but not quite what we came here for. Does anybody have anything to say about the lunchroom and safety?

ROY QUALLY [Oshkosh, Wisc.]: I have a question about the civic point system. I'd like to know more about the point system and how it works.

RUTH DELICH: At Kelly High school if you are a good hall guard, you may get from one to five points. If you participate in school activities, you may get from one to five points. If you are chairman of any class or a representative on the student council, you may be given certain points. When you get a total of some 65 points, I believe that is right, you get a civic award letter.

ROY QUALLY: Does the teacher use her own judgment as to how many points are given?

HUGO SCHMIDT: The teacher may, but there is a limit as to how many can be given for a certain activity. Students get civic awards for scholarship and also for being on time and for perfect attendance. Sixty-five is the total you need to get a letter and 100 points entitle a student to a civic award pin.

JOHN LENESSI: Getting back to the lunchroom question. Since every student can sit down at any table, there is sometimes some difficulty in getting someone to clean off the table. In our school, if you are sitting at a table and the fellow next to you gets up and doesn't take his tray, it is up to you to make him take his tray. If he doesn't, you are the one that is going to have to clean off the table. In other words, if you are the last fellow at a table and the table is dirty, it is up to you to clean it up. Our system works.

MARION YUSKI: Our hall guards always direct visitors entering the building who find it difficult to get to their destination. The hall guard has a badge which shows anyone who may be interested that he is a hall guard. The hall guards show this pass and walk through the halls. No student may walk through the halls without a pass.

TOM CHIBBAS: Most of you may have the idea that corridor problems are not serious. Last year there was an accident at one school where the janitor was killed because boys ran up and down the corridors. Corridor monitors handle traffic when there is a fire drill. When the fire gong rings, signals indicate which entrances are closed and monitors direct the students.

MR. GILLILAND: Do you find that any of your hall guards show partiality?

JOHN LENESSI: That does happen sometimes. But our organization is made up of hall guards and lieutenants and a captain, who is in charge of the hall guards. The lieutenant is continually watching the guards, walking his rounds on his floor. He has the right to ask anybody walking in the hall for a pass. If the person has no pass, he has to retrace his steps, and the hall guards on duty get it in the neck if they allow him to go back and forth freely. I think that eliminates partiality.

We have certain requirements for hall guards. A hall guard should be a sophomore or higher. Our hall guards are usually pretty big fellows.

JOHN CORBALLY [Seattle, Washington]: In connection with the hall guards' duties on fire drill, do you have planned drills where regular outlets are blocked so that students have to think in an emergency, and find some other exit?



TOM CHIBBAS: There is no regularly scheduled fire drill, but we have them frequently. There are different signals and in every room there is a chart which shows what each signal means, which doors are closed and which open. The hall guards see that students go to the right exits.

MR. CORBALLY: Suppose the bolt on some door jams so that you can't open it?

TOM CHIBBAS: There are quite a few entrances at Lane—more than 40.

MR. GILLILAND: Suppose the group leader has come to a blocked exit, is there any signal for stopping the group and reversing?

HUGO SCHMIDT: During a fire drill the students are supposed always to be quiet and the teacher is at the head of the group. In case of any bottleneck or a door being closed, the teacher has control of the group.

MR. GILLILAND: If you have 35 in a certain group, how can the teacher get the information back to the last ones just by talking? Do you use hand signals or anything of that sort to inform the group?

HUGO SCHMIDT: The teacher is in front of every class. Our classes at Kelly don't run larger than 30 students. We march in columns of four and that means the line isn't very long.

MARION YUSKI: The teacher can tell the students at the front to pass along the information.

TOM CHIBBAS: I'd like to add something. There are always three doors or at least two to each exit, so if one door is jammed the other two are open. It is the janitor's job to see that the doors are open.

MR. VAN POOL: Is there any question you want to ask about various clubs and their safety work?

JOHN LENESSI: At Lane Tech our student council constitution states that every semester a committee of four must be appointed for safety work. I am a member of that safety committee. At least once a month we are required to report to our shop superintendent who, in turn, gives us instructions on what we are to do and what we are to stress during the next quarter or the next period of time.

We have, as you know, many shops. Lane is a technical school. For every period in shop there is a safety man. On the average of three times a semester, we have meetings in our study hall. We discuss nothing but safety. We discuss the problems that have come before the safety men during the semester. Usually we have some safety expert from some organization to speak to us. In that way we become pretty well versed in safety.

MR. VAN POOL: You have heard a great deal about student councils. We advocate that safety activities be co-ordinated by the student council.

It would seem to me that in the respective schools represented by these students here, the student council is the co-ordinating agency.

Does anyone have any other questions?

EDWARD R. LYNN [Maywood, Ill.]: I think someone said that they had school fire brigades. During the fire drill each has certain station. Do you appoint a different person for each period of the day?

TOM CHIBBAS: In our school the hall guards are the fire brigades or guards. There are different students for each period.

MR. SANDUSKY: I'd like to ask a question. These boys and girls do a swell job. They are utilized inside the school, but we know that traffic is one of our greatest hazards today. When the students reach the streets what happens?

ESTEL HACK [Louisville, Ky.]: Our police department takes the position that when a student reaches senior high school age, he should be able to take care of himself.

RONALD MAUER [New Trier Township High School]: At New Trier we have safety patrols. Junior and senior patrols are stationed at different intersections.

ROYAL BROWNE [Chicago, Illinois]: I believe I can answer that question as to why there are no patrols when students get to high school. In the first place, in the elementary school students come from the immediate neighborhood, so all children cross and recross at the same streets and at the same time every day.

When a student goes to high school, he may come from a greater distance; consequently safety patrols at every crossing between that student's home and the high school would be impractical.

Lane Tech is a good example. Our area extends from the lake on the east to the city limits on the west; from North avenue on the south to the city limits on the north. We could not have a safety patrol at every crossing, therefore, we have them only around the school.

EARL R. STRANGE [Pottstown, Pennsylvania]: We have safety patrols in the junior and senior high schools. We have patrols at two main highways and we try to patrol four or five blocks around the school. This works very efficiently.

WILLIAM H. KEELER [Rochester, N. Y.]: With patrols since 1932 I believe Rochester can take credit for the first safety patrol in the secondary schools. We have ten public high schools and three parochial schools. Of these three, two are girls schools. We only use the girl patrol members to take the girls out to the busses and to see that they are loaded onto the busses safely. At every other one of our high schools, patrol members are stationed at an adjacent block or possibly two blocks away, depending on the traffic conditions.

We have uniforms for our secondary patrol members. In that way, we hope that motorists driving through the city will become alert to patrol members at the curbs and recognize them as they do police officers.

We have had a very successful program. A secondary school safety patrol is an asset and certainly will reduce accidents.

MR. GILLILAND: What are you doing about the motor scooter or two wheel vehicle?

PETER LEAHY: We have parking regulations for cars and motor scooters. They are limited to a speed of 10 miles per hour on the school grounds and they have to obey all traffic regulations in and around the school. As they enter and leave the school grounds, they have to stay on the driveways. They can't cut across the grounds.

MR. VAN POOL: What are you doing about teaching people to drive these scooters?

PETER LEAHY: I would think the laws and regulations pertaining to driving a car would apply to a motor scooter. We have driver education and training which teaches the laws of driving and the way to handle any motor vehicle.

MR. VAN POOL: Including a two-wheeler?

PETER LEAHY: Two wheelers—motorcycles or bicycles.

JOHN LENESSI: I'd like to clarify two points. When a student comes within a certain area, he has to dismount and walk the bike.

Every student is required to take driving. That is a safety measure.

MARION YUSKI: I'd like to add that at Kelly the students are allowed to ride only one on a bike.

MR. STRANGE: In the state of Pennsylvania, in our motor vehicle code, a scooter bike is considered a motor vehicle, the same as an automobile. Now, we also have a bicycle ordinance. We issue licenses, inspect bicycles and teach correct riding habits. A license costs twenty-five cents a year. We also have bicycle courts in the schools, and we have a local police bicycle court. The students run their own bicycle courts.

MR. GILLILAND: This last week I was in a meeting with a group of young people, and there was only one person in that group of legal driving age, yet all of them were driving motor scooters. What are you going to do with pupils that are driving in violation of the law?

MR. STRANGE: At the age of 16 they must have a license to drive, and if they are picked up without having a license to drive, they have to pay a fine. I believe it is 25 dollars for the first offense. I don't know of any boys or girls in the state of Pennsylvania that drive scooters without being licensed.

MARIAN TELFORD [Chicago, Ill.]: The subcommittee on powered cycles of the National Committee on Uniform Traffic Laws and Ordinances has made a thorough survey of the problems of the motor scooter—what they are under the law, what type of legislation a state should have, what type of scooters should be allowed to operate, vehicle standards as to brakes and lights and so forth. Unfortunately the study dealt less with education than with anything else, but it is available in mimeograph form. You can get it by writing to the National Safety Council. Ask for the Public Safety Memo on Motor Scooters.



# The Home Economist's Responsibility for Home Safety Education

By GLADYS T. OLSON
*Itinerant Teacher Trainer, Iowa State College, Ames, Ia.*

Who will spend time and energy to fight home accidents? Home economists. Why? Because anyone who professes interest in and takes responsibility for helping people with their home and family life problems must include some home accident prevention in his education. The home economics teacher has a unique opportunity that is not offered any other teacher in a school. In every phase of family living, problems arise because of home accidents which affect the way families may attain their goals. If home safety education is not taught in our schools, a large number of people will never be reached.

Problems in each phase of home and family living and some information and methods to use in presenting these problems are given in the manual "Safer Home Living," a publication of the National Safety Council. A few of the problems under each phase will serve to illustrate the kinds of responsibilities home economists have for home safety education.

*In home management*

What short cuts help keep the house orderly?

Does your family have the protection of an orderly house?

*In child care and training*

What are the main types of home accidents among children?

Do homes in which there are small children provide conditions that are safe for them?

*In laundering*

What clothing is safe to wear when doing the family laundry?

Do . . . invite injury when you iron?

*In selection and care of clothing*

Do you dress safely for your work?

Does home dry cleaning pay?

*In meal preparation and food preservation*

How many chances do some homemakers take every time they cook?

What are the major causes of accidents in home canning?

Another phase of family living, family relationships, needs to be analyzed carefully to determine the emphasis which may be placed upon home accident prevention. A study of the adjustments necessary when a family member is killed or injured in an accident makes it possible to arouse interest in accident prevention. In family relationships and home management, there is a direct link between traffic, industrial or home accidents, and the home situation.

As we proceed with this topic, we could consider what ought to be done, but I prefer to tell about some things that are being done. To start with, it seems safe to begin with situations we know best. In collecting examples from all over the United States it would be possible to secure many good safety education ideas, but it is also important to consider what is going on in smaller areas.

Home economists in Iowa, through their state home economics association, conducted a survey of homes to discover hazards lurking there. Two objectives were decided upon for the survey.

1. To arouse interest in home accident prevention.
2. To find some indication of common hazards in homes.

The survey indicated that five hazards were common in the homes of the state.

1. Stairs were without handrails.
2. Irons needed heat resistant stands.
3. Oily mops and dust rags were not kept in metal containers.
4. Step ladders were lacking or poorly constructed.
5. Scatter rugs were skidding.

Findings of this survey have been used as an incentive for program plans for at least two home economics groups in the state—the home economics teachers and the home economics extension service. Home economics teachers have been working upon these safety measures through their day school programs, adult programs and club programs.

High school home economics girls have a club named The Future Homemakers of America which is commonly called the F.H.A. In 1947-48 home accident prevention was accepted as an activity in the state program of work for F.H.A. chapters. Home safety ideas were presented at district conferences in the form of exhibits and skits pointing up the five hazards common in homes and in turn local chapters used some of the ideas in planning their programs of work.

After the year of work, 43 of the 61 F.H.A. chapters in the state reported the removal of safety hazards. The removal of a total of 1,959 safety hazards was reported. One chapter reported 300 and another boasted 353 different hazards removed.

One chapter reported that one of their most successful events of the year was a home safety skit that was written, directed, acted and produced by F.H.A. members. The skit, "A Day in the Lee Home," portrayed Judy the teen-age daughter getting ready for a dance. The action included numerous little accidents of everyday home life. Points which were emphasized included:

1. Put the iron on the stand when you leave it.
2. Pick up toys and balls.
3. Always have good bulbs in the light sockets.
4. Hang up your clothes.
5. Keep closets neat and clean.
6. Put everything back where it belongs.

In summary of gains secured, this F.H.A. chapter stated the praise received was worth the effort put forth, and the girls believed their aim of making others more safety conscious was fulfilled.

Even though convinced that home safety education is a part of her job the home economics teacher finds that many difficulties beset her path. It is difficult to change attitudes and practices and to interest pupils in home safety. Even teaching such specific experiences as using a safe procedure when lighting gas ovens creates problems.

One teacher demonstrated a safe method to use in lighting a gas oven. On the following day the ninth grade girls were preparing a simple supper in which they needed the oven. The teacher stepped back into the classroom just in time to hear a girl state in a loud voice as she was about to light the oven, "Stand back girls, I'm going to light the darn thing."

In another town the home economics teacher was very disturbed because one of her eleventh grade home economics girls singed her hair, eyebrows and lashes while lighting the oven. A repetition of the oven lighting demonstration was given to the whole class by the teacher. The following day another pupil had an oven lighting accident. As a new approach to the situation, attractive signs were posted by each stove "Light me First." After the two accidents and with the constant reminders of the small posters the oven lighting accidents ceased.

As a part of an all-college project each department of the home economics division at Iowa State college examined the amount of home safety education included in the courses in their curriculum and checked their laboratories to discover any hazards which might cause accidents. The check lists in "The Hazard Detector," a National Safety Council publication, were used to help analyze the safety content of the curriculum. Suggestions for improvement were made and some improvements were made.

Most of the examples of home safety education in this presentation have come from the work of home economists who would be classed as home economics teachers. I would like to mention a few examples of home safety education from other fields of home economics education.

The extension specialists in home economics have an opportunity to emphasize safety in all phases of their work. An example of the way home safety education is being included in extension programs is shown by the housing tour in Scott county last spring. Each of the nine houses chosen to be included on the tour had stair handrails where needed. Some homes which would have been chosen were eliminated because they had not yet put up handrails. During the open houses each leader called attention to the safety features in the homes.

In planning the house and room layouts for the new Step Saving V Kitchen designed in the Bureau of Human Nutrition and Home Economics, one safety feature is evidenced in the fact that everything can be easily reached without getting on a stool, and things are arranged so that areas are given sufficient space eliminating cluttering



to the danger point. All publications from the Bureau are carefully gone over to be sure recommendations incorporate directly or indirectly the safety factor in household operations.

There has been progress made in integration of home safety in the home economics curriculum because home economists have pooled their efforts and experimented, but it is only a beginning. Any type of integration takes time and imagination and a concerted effort to pool our efforts and to exchange ideas can make it possible to develop more effective safety education programs.

## Safety Education Invades the Teacher-Preparing Curriculums of the South

By SOLON B. SUDDUTH

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It is hoped that the invasions of safety education in the teacher-preparing curriculums of the southern colleges and universities will be as impressive as Sherman's invasion of the south; the invasion of the carpet baggers; the invasions of the boll-weavil, the cotton mills and industry and will prove helpful in making the present school generation and their adult contemporaries more safety conscious.

Reviewing the data contained in *Accident Facts* we see the need for preparing teachers to teach and to practice safety education.

Preventing and avoiding accidents will come about by education. Therefore, let us consider what is being done to meet this need in the teacher-training institutions of the south.

In August, 1948, a questionnaire on status of safety education was mailed to administrative officers of 100 college and universities in 12 southern states. In selecting the institutions, criteria were developed to insure a reasonable sampling of all of the colleges and universities in the 12 southern states.

The first criteria was that representative colleges and universities from all 12 southern states must be included. The second criteria was that the institution must have a four-year curriculum which prepares teachers for the teaching profession. The third criteria was that the institution must be accredited by the Southern Association of Colleges and Secondary Schools, which is the accepted agency in all of the states included except Arkansas. Arkansas is affiliated with the North Central association. A fourth criteria was that negro colleges be included. A fifth criteria was that both private colleges and state supported colleges must be included in the study.

By using these criteria as guides a questionnaire was mailed to 74 white colleges and 26 negro colleges. All states were represented by five or more colleges.

Replies to the questionnaire were received from 55 white colleges and from 6 negro colleges. Returns were received from three or more colleges in all states covered.

In the curriculum offerings of the 61 colleges reporting, 141 separate courses are offered in 7 areas of safety education. It was found that 27 of the 61 colleges offer a course in general safety, 48 offer a course in first aid, 7 offer a course in playground safety, 36 offer a course in life-saving and water safety, 13 offer a course in driver education, 5 offer a course in home accident prevention and 5 offer other courses in safety.

The health and physical education departments offer 129 of the courses, the education departments offer 5 of the courses, the home economics departments offer 3 of the courses, the industrial arts departments offer 2 of the courses, and the English and the social studies departments offer 1 course each in safety education.

It seems that the health and physical education departments have assumed the responsibility for offering most of the safety education courses. In the driver education course the major responsibility has been assumed by the health and physical educa-

tion departments but there is a distinct interest indicated by the education departments in this area of safety. Four of the 13 courses in driver education are taught by the education departments.

College credit is allowed in all but nine of the safety courses offered. Four colleges do not allow credit for courses in life saving and water safety and five allow no credit for courses in driver education. There is no common pattern for the number of hours credit allowed by the separate schools in the different courses. Credits range from one half quarter hour credit allowed by one school in life saving and water safety to five quarter hours credit allowed by eight schools in such courses as general safety education, first aid, and playground safety. The nature of a course seems to have little effect on the college credit allowed.

In some of the schools there are certain courses which are prescribed for all students who are preparing to become teachers. Of the 141 courses in safety education, 27 are listed as required courses. First aid is a required subject in 10 colleges and the general safety education course is required by 9 colleges. It is assumed that state certification laws have some bearing on these requirements.

Safety education is integrated as separate units in 162 courses other than the courses mentioned previously. General safety education is included as units in 24 courses, first aid units in 28 courses, playground safety units in 42 courses, life-saving and water safety units and driver education units in 15 courses each, home accident prevention units in 34 courses and other safety education units in 4 courses. There is a preponderance of integrated safety education units in other courses in the health and physical education departments. These departments show a total of 112 integrated units in health and physical education courses. The home economics departments have 17 integrated units, the education departments 14, the industrial arts and science departments 7 each, the orientation courses 3 and the social science and engineering departments 1 each.

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## Safety Education Needs of Pre-Service Teachers

By MARION R. TRABUE

Dean, School of Education, The Pennsylvania State College; Member, National Commission on Safety Education, N.E.A.

What preparation does a prospective public school teacher need in the field of safety education? It is obvious that the real needs of a young teacher depend upon what is to be expected of him as a teacher. If we expect more of new teachers than they can actually do, then we should revise our expectations and modify our concepts of their needs.

In order to be realistic in any statement of the pre-service teacher's needs, we should look first at a few practical facts. While a few states have made provisions for five years of college work as the basis for certification of public school teachers, the great majority of our public schools are still being taght by teachers who have had only four years or less of college preparation. In most parts of the country, there are still shortages of teachers qualified at the four-year level for elementary schools and for certain subjects in high schools. These shortages are likely to gontinue for several years.

Another fact which must not be overlooked is that the public and the school authorities who represent the public still insist that teachers should have had a few courses in college in those subjects they are going to teach in the schools. Furthermore, in most high schools, a beginning teacher must expect to be assigned to teach in at least two broad fields: science and mathematics, for example, or English and the social studies. In order to teach science in a high school, a teacher is expected to have had in college at least a couple of courses in each of the major sciences: chemistry, physics, botany, zoology and geology. The public commonly expects the young teacher also to have extended his general education while in college. And then the



educational authorities insist that he shall have studied some psychology and have learned something about schools and about teaching. To secure all of these courses in four years at college is not an easy matter. However desirable you and I might think it would be to require an additional college course or two in safety education, there is little real chance that these can readily be squeezed into the already overcrowded four-year curricula in teacher education.

Although the number of prospective teachers who can be required in the near future to take safety education courses in college is relatively small, you and I know that the pupils in our schools must be taught, and taught effectively, to live more safely.

Somebody must do something to reduce the pain, suffering and death resulting from accidents, a large proportion of which are certainly preventable. The greatest hope I can see for reducing the number of accidents is through effective instruction by professional teachers. Furthermore, public school teachers have, I believe, a clear obligation to teach their pupils to avoid accidents. That is one of the things for which they are paid from public funds.

No teacher or intelligent student who examines carefully the problems of our modern life together can avoid recognizing that we are still far from having satisfactory solutions for the common problems of safety. Thousands of people are killed and tens of thousands are injured each year by automobile accidents, falls, burns, drowning and firearms. Any school child can recognize the vital importance of this problem of accidents to the common welfare, and he can easily be led to co-operate with others in planning better solutions.

No public school teacher, regardless of the school subject he teaches, can be excused for neglecting opportunities to stimulate students to analyze situations that may be unsafe and to plan co-operatively for their correction. Preoccupation with academic matter that prevents giving attention to an unsafe situation may not only result in a serious accident, but robs the students of the practical training in co-operative planning for the common welfare which is the fundamental purpose of the state in providing education.

One of the greatest causative factors that appears when accidents are carefully analyzed is lack of consideration for other people. The driver of the death-dealing car was thinking, we discover, only of his own desire to get somewhere in a hurry. Explanations and excuses occur over and over again. Preoccupation with one's own immediate personal desires and lack of any real concern for the welfare of others are the real villains that cause most of the avoidable accidents that occur each year.

In discussing safety education we should keep in mind the fundamental purpose of the democratic state in establishing and maintaining public schools: the development in citizens of those characteristics which will enable them co-operatively to work out better solutions to their common problems of living together. Let us look now for a moment at some of the other vital problems of our everyday life. Whether we read the daily papers or listen to the news reported by radio, we always meet the same problems: strikes and labor disputes; inflation and the coming depression; international disagreements and threats of war; increasing divorce rates and the disintegration of homes; racial prejudices and conflicts; and so on, day after day. Each of these problems, when carefully analyzed, grows out of exactly the same human factor that is causing so many tragic accidents: lack of thoughtful consideration for others.

Human beings, in common with other animals, want food and comfort for themselves. Science and invention, however, have made such complex changes in the conditions under which men live, that it is no longer possible for each individual to obtain everything he wants without assistance from other persons. Each of us is dependent upon thousands of other individuals and groups for the goods and services he wants, but we have not learned as well as we must how to behave toward these other persons with whom we must co-operate. If human beings can be taught to act more courteously, thoughtfully and helpfully toward each other, we shall not only have fewer accidents, but we shall also have better and more permanent homes, greater volume and continuity of industrial production, less severe alternations between economic inflation and depression, less crime and delinquency, better governments and less war. The time has passed when reading, writing and 'rithmetic

could properly be referred to as the "fundamentals of education." The real fundamentals of education in the modern highly-complex world are *co-operative human relations.*

The kind of education necessary to produce citizens who will work together effectively on common problems involves much more than knowledge and skill in the traditional school subjects. In an individual who is selfish, unco-operative, and anti-social in his attitudes, knowledge and skill are powerful agents for the destruction of civilization and of democratic institutions.

Only in an individual who has sincere attitudes of respect toward other people and the determination to understand and co-operate with them do increased knowledge and skill become a socially desirable objective of education. Attitudes and habits of co-operation and the determination to work constructively with other people in improving the common welfare are the primary objectives toward which all education and teachers of all subjects must strive if they are to serve the fundamental purpose for which a democratic state supports education.

In order to be successful in developing such attitudes, habits and determinations in their pupils, teachers must provide them with a continuous progression of satisfying experiences in working co-operatively with others on problems that are vital to them. Children always have problems of conflicting interests and purposes that are just as real and vital to them as the problems met by adult individuals and groups.

When two children in the nursery school want to play with the same toy at the same time, for example, their teacher has a golden opportunity to lead them in developing a co-operative solution which will be satisfying and educative for both. When the pupils of an elementary grade find that some of them wish to play ball on the same part of the playground that another group wishes to use for playing marbles, an unusually rich opportunity for fundamental education in human relations is presented. Such problems of conflicting human interests must be recognized as the true curriculum of fundamental education today, and should be given first priority in the minds and efforts of teachers.

One of the chief reasons for our past failures to develop the attitudes and habits of co-operation which are so fundamental today is that we have not, either in our thinking or in our school practices, actually recognized that these are far more important than subject-matter. We have rather consistently exercised autocratic authority in deciding the human issues that arise among students, in order to keep order and to provide the peaceful atmosphere in which school work could be carried on efficiently. Our failure to recognize that being considerate and mutually helpful toward other persons is actually more important than having high academic knowledge and skills has led us to overlook the rich opportunities that arise constantly in every school community for the development through vital experiences of the co-operative attitudes, understandings and habits that lead people to work together effectively on their common problems.

Not only have we neglected to recognize co-operative human relations as the most fundamental outcomes to be sought through education, but we have frequently forbidden the use in schools of the very materials which constitute the type of curriculum necessary for the achievement of these outcomes. We have *actually told* teachers to "avoid controversial issues," and yet teachers have no greater obligation than to teach young people how to resolve such issues through intelligent co-operative analysis and adjustment. Until we learn to use the real conflicts in interests, purposes and ambitions that arise in the school and community as the basic materials of modern education, we shall not be able to develop the co-operative attitudes, understandings, skills and habits that are absolutely essential to the preservation and improvement of our democratic society and its institutions.

Every person who is preparing to teach any subject in any public school or college should be led to understand that his chief responsibility is the development (1) of strong attitudes of consideration and helpfulness toward others, (2) of firm determination to co-operate with others in solving problems of the common welfare, and (3) of efficient skills and habits in analyzing such problems, in gathering and interpreting pertinent data, and in co-operating with others in the development of improved solutions.

Such an understanding of what his professional task involves will require him to become familiar with authoritative sources of information about safety, health, economics and other problems of the common welfare, even though he knows he is to be employed as a teacher of English, mathematics or science. It may not be necessary for every teacher to have a special college course in safety education, if only each has learned to use vital problems of safety as educative experiences for his pupils.

Every school of any size ought probably to have at least one teacher who has had rather extensive training in safety education, so that he may be called upon by pupils, teachers and citizens for expert knowledge and skill in that field.

Any teacher who is employed to instruct pupils in the carpentry shop, the machine shop, or the foundry needs very specific knowledge of safe practices and specialized skills in teaching such practices. The teacher who is to assume responsibility for teaching pupils to drive an automobile must also have had thorough training in the what and how of safe driving and in the what and how of teaching safe driving. Teaching a student to operate a dangerous machine requires the possession of many items of specific skill and knowledge that are functionally related through extensive practice to the machine itself and to the conditions within which it operates, as well as the general preparation which all teachers should have.

All teachers should be prepared to develop in their pupils the attitudes and habits of co-operation that are involved in living together constructively in the modern world. This certainly includes co-operation in developing safer practices in daily living. The hazards that are involved in operating certain types of modern equipment are so great, however, that a few teachers need to have highly specialized training for teaching the safe operation of that equipment.

In my judgment, it is not possible to achieve desirable standards of safe living without the co-operation of all teachers, nor is it possible today to achieve those standards without some teachers who are especially prepared for giving instruction in specific areas of safety. Both types of teachers are needed in safety education.



## Off-Street Training Areas for Driver Training

By H. JAMES TYSOR
Safety Instructor, N. R. Crozier Technical High School, Dallas, Tex.

In planning and organizing a complete driver education and driver training program, the question always comes up regarding the space needed for the behind-the-wheel or laboratory-experience training. Most schools are able to arrange for a room for classroom instruction, but they cannot see their way clear to provide additional space on overcrowded campuses for behind-the-wheel training. Perhaps the reason for this is a misconception of the amount of space needed.

It is the common opinion of many school people that several acres are required, especially if more than one car is used. There are already heavy demands on the school grounds for playgrounds, athletic, and ROTC activities; to squeeze in another activity, such as a moving automobile, is almost out of the question.

But the area need not be large nor paved and curbed; it should be a controlled or supervised area which may be either *on* or *off* school property. The location of the controlled driver training area may be determined by a survey. The area may be on the school grounds, or on vacant lots or parks, or authorized blocked-off streets.

Some schools, especially fringe schools in large communities, are not concerned about space. In such cases, it is most desirable that the controlled area be located on the school grounds, placed far enough away from other activities so that the practice area does not create hazards. If it is necessary to place the area close to other activities, the driving practice area should be properly fenced and closed to all outside traffic.

The area selected does not have to be of any particular shape or contour. A straight-away, at least 75 feet long and 23 feet wide with two fifty-foot circles (making a figure eight) is suggested.

In all controlled driving areas there are certain advantages:

1. The instructor is able to give closer supervision.
2. Danger of collision with regular traffic *is eliminated.*
3. Beginners are less nervous because traffic hazards are at a minimum.
4. Parents feel more secure.

The main disadvantage of the controlled driving area is that the student doesn't get the feel of actually driving and meeting street conditions. However, this may also be overcome on the controlled driving area by designating a certain course, approximating on-street conditions, for final completion of the laboratory experience.

If the area is to be permanent, it is best to prepare it for all-weather use. The area should be curbed and hard surfaced.

The teaching technique and lesson plans will, of course, vary with the type and layout of the course. Close supervision and strict regulations as to movement of cars must be observed.

Semi-permanent areas must have light movable equipment that is not bulky but is easily handled and stored. Stanchions to hold flag staffs may be made by filling discarded gallon cans with cement leaving a center core for sheet metal to hold the staff. Staffs may be five feet long and jointed for easy storage in the back of the car. Simulated traffic lights, hand operated, may be used along with movable traffic signs.

Teaching driver training in a small restricted and supervised area demands superior teaching ability.

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# Automobile Driver Education and Training
## A Small Community Plan

By SAMUEL HOTT
Bedford High School, Bedford, Ohio

In introducing our subject we will make the *following assumptions:*

1. That the value of automobile driver education and training be recognized by the local Board of Education.
2. That the Board is willing to authorize the placing of such a course in the high school curriculum.
3. That the local automobile club is willing and capable of supplying a training car.

We make the above assumptions for the purpose of introducing the course into the curriculum. Whether the course stays as a part of the high school program will depend upon how well it is sold to the community. In other words, there must be someone or some group who is willing to definitely sell *the course to the community through the* medium of the students and community contacts.

Selling will not be an easy job. There are far too many people who firmly believe:

1. That *automobile* driving is far too easy and simple to be placed as a high school subject.
2. That it is an individual matter and, as such, should not be charged to the community.

The above arguments gain added impetus when the cost sheet is studied and comparisons are made with the cost of teaching other subjects. Increased per pupil costs cannot be denied. The Cleveland per pupil cost range is $27 to $45. My superintendent figures per pupil driving costs to be $20 greater than that of other subjects. The answer must come in the total value derived from the course, both to the *individual* and to the community. Proof must be given that the training of automobile drivers will show a definite reduction in automobile accidents.

*Many Ohio high schools would like to* have a driver education and training course if it were possible to have a trained instructor and equalized per pupil cost. Some state colleges are taking the necessary steps to help in the training of instructors and some state legislatures are recognizing the importance of this type of training by making grants of money to aid in the financing of the program.



We are in our third year of driver education and training here and we feel this is the proving period. The novelty has worn off, and the superintendent has sharpened his pencil. Figures show an alarming high per pupil cost, most of which is instructor's salary.

Our training car is supplied by a local dealer under the supervision of the club. Car maintenance has been paid by the Board of Education. This year we plan to assess a student three dollars to cover this item. That leaves the instructor's salary which, in the future, will be met by a matching program of the Board of Education and the local Auto Dealers association through the local Safety Council.

This set-up will allow us to make the course compulsory, if all goes well. The reasoning back of this last statement is that a large number of students, particularly boys, still feel that it is absolutely a waste of time to spend two periods a week for 18 weeks just to learn to drive an automobile. This idea comes largely from the parent who learned to drive under far less complex conditions than those which face the boy and girl driver of today.

I will attempt to explain our set-up and procedure.

The State of Ohio sets 16 years as the age when a boy or girl may receive a temporary driving certificate. This certificate is a prerequisite for the driver education and training course. The only other qualification required is the written permission from the parents. We enroll a limited number each semester; usually 28 or 32 students to a class. This group must meet as a class for 36 clock hours during the semester. In addition each student must have a total of 24 clock hours in the training car, 18 of which are allotted to observation and 6 hours behind the wheel. This makes a total of 60 clock hours required of all students.

The time sheets are *rigidly kept* and all lost time must be made up. The state Department of Education grants to all those who satisfactorily fulfill the above requirements one-half unit of credit, and the Ohio State Highway department grants a permanent driver's license. The class is organized in groups of four students each for the laboratory training; each student having 15 minutes driving and 45 minutes observation time in each hour.

Street and road maps are studied in class time for the purpose of directing the driver while in the car. Classroom lesson precedes each driving lesson.

The first part of the program dealing with the automobile is spent in getting acquainted with the car. The class, as a whole, meets in a closed area with the car as exhibit "A." A thorough study and discussion is made of the following items:

1. Things to note as you approach the car.
2. The various systems, their parts and the function *of each as it applies* to the total operation.

After these sessions the class is divided into groups. Further discussion and review is held within the groups. The groups are *now ready to start working* the various devices necessary to operating the car, this done in a closed area.

Students are not taken on the street until they pass the requirements in the closed area. Once they are on the street we give them open road driving until they are familiar with the car motion. The next assignment is driving in traffic, followed by instruction and practice in all forms of parking. Precision skill tests are the last phase of the program preceding the skill tests which are given by the State Highway patrol.

The students, while observing, have checklists which are scored against the driver. The instructor checks the observers in their ability to rate each driver. Driving skills are practiced in the daily driving lessons and driving skill tests are given periodically.

Driving lesson plans are supplied to those students who will be driving the family car. This is done to assure the instructor that the family is acquainted with the driving practices taught in the program.

Students are encouraged to get out-of-class driving practice. However, a check is kept on those students who are doing out-of-class driving. A blank is given the student who must have it filled out by the accompanying driver. This blank notes the time, miles driven, weak or strong points, and the signature of the licensed driver.

This year we are organizing our teen-age drivers who drive a minimum of 100 miles per month into a Safe Driving club. The objective is somewhat on the same line of thinking as the safe driver programs of Commercial fleets. Drivers will be encouraged to build up continuous annual safe driving records. Proper recognition will be made of the safe driving group.

I would like to add a word about our follow up system. As a means of evaluating the program, a list of the graduates are turned over to the police department. If, and when, the names of graduates appear upon the police blotter, those names are turned over to us. We keep a complete filing system and follow up these violators by direct contact.

## A Plan for a Metropolitan Area

By MILDRED KEIFFER
Supervising Teacher of Safety Education, Cincinnati Public Schools

Presented by ELIZABETH STEINLE
Driver Training Teacher, Dayton Board of Education, Dayton, Ohio

Driver training concentrates attention on only one phase of the over-all safety program, the foundations of which are laid in kindergarten. Throughout the 12-year program of safety education, the objective is the building of habits, attitudes, skills and understandings essential to vigorous, happy and safe living. The smallest child must be taught how to meet the hazards of everyday living in his school, at home, in recreation, in holiday observance and on the street where he is a pedestrian or in a vehicle where he is a passenger. He must be taught the safest way to travel between his home and the school, how to distinguish color, so that he can understand the traffic lights. He has to be trained to know right from left, and he must learn to look first to the left and then to the right as he crosses a street. He is taught to respect the school patrol and the policeman because they are friendly helpers who are charged with his safety.

As the child advances through the grades, he is trained to meet environmental hazards with economy and safety of motion and without fear or recklessness. He is expected to develop a sense of responsibility for the safety of others as well as of himself. In the tenth grade this responsibility of the individual for the safety of others receives special emphasis as it applies to drivers, passengers and pedestrians in traffic situations.

The development of specific safety skills, of simple technical safety understandings essential to the safe, sane and co-operative use of our streets and highways, and an appreciation of the responsibility of drivers to society, both individually and as a group, are prime objectives of the course in driver education. It is not our purpose to produce mechanical or technical experts. We hold that driver education is primarily traffic safety for "consumers." Everyone is a pedestrian and most of us are passengers. All must know the laws of the road, road signs, the science of traffic safety and the scientific principles involved in traffic.

The building of proper attitudes is our first aim of driver education. We work to establish in the minds of girls and boys the sound principles and practices fundamental to safety and efficiency in traffic, whether they be driver or pedestrian in Ohio or another state, in the city or on the highway.

The teachers who were in charge of our driver education classes last year received intensive training in a special institute.

At a spring appraisal meeting, the teachers of driver education suggested that less emphasis be placed on technical aspects in order to free more time for basic principles. Everyone reported that pupil interest and enthusiasm were high. Pupils were eager to survey their home communities for safe driver and pedestrian practices in operation. Students identified local traffic safety problems, conducted experiments, produced graphs, made clipping collections, and drew special maps showing local danger areas.



Driver education is a part of the prescribed and required high school course. A pupil who does not make satisfactory progress must repeat driver education the next semester. A student has not met his graduation requirements until he has completed the course. The classes meet once a week for a semester and are compulsory in the tenth grade.

The texts used are the standard ones. Each school has a set of standard traffic signs and a set of four testing devices for measuring physical capacity for driving: range of vision, depth perception, glare resistance, and reaction time. It is important that boys and girls understand the effects that physical, mental and emotional characteristics have upon drivers and pedestrians. It is also important that they recognize their own deficiencies and that they know what they must do to remedy or compensate for such deficiencies.

Standardized tests are given at the end of the semester and the score is entered on the permanent record card of the pupil. Pupils are expected to devote as much out-of-class time to preparation for driver education as they do for other high school courses. Driver education is a prerequisite for behind-the-wheel training. The theory in Cincinnati is that pupils are not to be allowed in the training car until they have learned all that can be taught in the classroom.

Behind-the-wheel training was introduced in January 1948. The educational philosophy justifying this undertaking is based upon the belief that the school is a supplementary educative agency which begins where other agencies leave off. The school provides, first of all, those instructional services for which it has chief or sole responsibility—the fundamentals. Then the school makes the greatest possible contribution to those broad objectives—character, thrift, consumer competence, safety, etc.—which it shares with other agencies in society. It is the function of the schools to provide the necessary instructional services not provided by other agencies.

The question of responsibility for behind-the-wheel training is determined by the social need for the training and the degree to which the home, the automobile club, the police department, and other agencies are providing the instruction. Behind-the-wheel training is accepted on a par with other phases of safety education, as well as the other broad general objectives of education for which the schools assume partial responsibility with other agencies.

Behind-the-wheel training should be made available to those who have not had instruction elsewhere; to those who do not have a driver's license but who will in all probability drive a car or truck in the near future; and to those who have already passed satisfactorily a test in driver education covering the laws of the road, simple mechanics of the car and the principles of safety.

Because behind-the-wheel training was needed most urgently at Central Vocational high school, whose graduates must be able to drive to be placed in jobs, the first practice car was sent there. It was supplied through the co-operation of the Automobile Dealers association and a local dealer.

Three teachers at Central had been driving instructors with the Army or Red Cross during the war, and they were qualified to assume responsibility for behind-the-wheel training. They readily gave their unscheduled periods to the new course and the eligible seniors requesting it. Form letters to obtain parental consent were devised and the pupils instructed to obtain temporary instruction permits in accordance with Ohio laws.

In August 1948, another training class for teachers was conducted, and additional dual-control cars added to the program.

Under our present setup, four pupils are taken in a dual-control car at a time for a period of an hour. Each pupil drives 15 minutes, while the other three sit in the back seat and observe. The instructor occupies the front seat next to the driver where he can operate the dual controls. He must have his own rear vision mirror, too.

Practice areas, or little traveled side streets are a problem for Central, because Central high is located in a busy section of Cincinnati. Eden park can be reached in about eight minutes and Lunken airport in about 20 minutes. As soon as the pupils can guide the car and control the beginner's nervous accelerator foot, the Central teachers take them out on traveled streets where there are traffic lights, hills, stop signs and other situations the young driver must learn

to meet. The teachers at Central wish to concentrate on driving in traffic rather than on parking maneuvers because they feel the need is the most immediate and pressing. Few fatal accidents are caused by faulty parking practices. The urgent problem at Central is to prepare pupils for jobs as mechanics, garage attendants, electrical workers and similar occupations requiring ability to drive cars and trucks.

Temporary record forms were tested at Central. In addition to the letters to parents and parents' permission cards, a pupil's record and log sheet for the training car were prepared and tried out. These were referred for study and revision to the Institute in Driver Education and Training at the fall Teachers institute in 1948.

The final examination given to the Central seniors to help them meet the requirements for their Ohio Driver's license was prepared by the staff at Central and submitted to the Institute for approval. These forms are now ready to be used in additional classes as they are set up in the other high schools.

Behind-the-wheel training does not lead merely to the successful operation of the car. It offers an opportunity for the pupil to begin to practice what he learned in driver education. Too often in the past young drivers were taught simply to drive in a straight line, brake within reason, shift gears at traffic lights and not to park next to a fire plug. The new method teaches the pupil to have the proper respect for his *powerful piece of machinery* and teaches him what it will do if he loses control.

Pupils, parents and the community in general are enthusiastic in their approval and support of the two courses, driver education and behind-the-wheel training, now offered. There are still administrative problems in the scheduling of classes and the location of practice areas but they are being solved. We look forward to a happy period of steadily improving traffic accident records, and to the day when we can observe the extended arm of the driver ahead and be confident of more than just the fact that his window is open.

We have attempted to meet the problem of traffic safety education by breaking up the whole field into two separate areas. *Driver education, designed to meet the needs of all "consumers,"* is required of all pupils in the tenth grade for one hour each week of one semester. It is followed by the elective behind-the-wheel training course which is open to any pupil in the eleventh and twelfth grades who has satisfactorily completed driver education. All pupils function as pedestrians and passengers, and need training in those fundamental principles, attitudes and habits of thinking dealt with in driver education. Those who will become drivers need to master additional skills and habits taught in behind-the-wheel training.

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## The American Automobile Association at Work in Chicago

By MATTHEW C. SIELSKI
Director, Safety and Traffic Engineering Department, Chicago Motor Club

How is the American Automobile Association affiliated with my own organization—the Chicago Motor Club? The American Automobile Association is an association of 700 independent motor clubs and branches in every state throughout the country. Although these clubs operate within defined geographical areas, they are all members of the AAA family. Their common purpose is to service members and the public in all phases of motoring. Each club is individually managed. The national organization is governed by a board of directors composed of representatives from individual clubs.

Most of the services rendered by the Chicago Motor Club to its own members in Indiana and Illinois are very similar to the services rendered by AAA clubs elsewhere in the country. Even though individual requests for material or services from the territory are sent to the headquarters of the AAA in Washington, they are referred for action directly to the local club.



We receive requests by mail or phone and these are handled directly through mail except in the case of Chicago schools. In some instances we technically advise, and, when requested, our staff members visit schools. With but a few exceptions all services and material rendered by the club are without charge to the school. I shall attempt to touch briefly upon the various services which the club performs in conjunction with the school program.

### Co-operation with Grade Schools

*School Safety Patrol*—In its territory, the Chicago Motor Club is in contact with some 4,000 grade schools. The School Safety Patrol is one of the most important activities of our organization. The Chicago Motor Club pioneered in this work. This movement was started in 1922 and has been saluted as one of the greatest contributions towards the saving of children's lives in Chicago. More than 45,000 patrol members engage in this life saving work in the area serviced by the club. As a result of this patrol movement, the annual death toll among children has been drastically reduced and has continued to stay low in contrast to the ever increasing rise in adult fatalities. Through the years, the Chicago Motor Club has studied patrol operations and has been active in the development of improvements such as better patrol training. In conjunction with this training program the club has developed and produced a film entitled "Trained to Serve." This film has been adopted by the American Automobile Association and the title changed to "How Patrols Operate."

Any school wishing to establish a patrol can do so by contacting the nearest branch of the motor club. We furnish schools with all the necessary material without charge.

In conjunction with the school safety patrol movement, the club sponsors two major activities. The first consists of the awarding of certificates to schools maintaining a perfect year without an accident or fatality. The other activity consists of a program of recognition for achievement by means of picnic programs at the end of the school year. All active patrol members are guests of the motor club at local parties or picnics held in honor of the splendid work done by these patrol members.

*Poster and Lesson Sheets*—Another important activity of the motor club is the issuance of poster and lesson sheets. These are distributed monthly to all grade schools. The lesson sheets prepared by experienced educators, and graded for different age levels are designed to provide busy school teachers with advance projects throughout the school year. In addition to the posters and lesson sheets, teachers receive a guidebook with numerous suggested projects. The name of this booklet is "Guide for Teaching Traffic Safety." The posters, of course, dramatize whatever traffic safety theme is contained in the lesson sheets for the particular school month. All posters and lesson sheets are provided to schools that are on our mailing list.

*Films*—The Chicago Motor Club has available a complete library of safety films. A bibliography listing all of the films available can be obtained upon request.

*Safety Courts*—The use of safety courts in grade schools is becoming more and more popular. Usually spearheaded by school patrol members, this court is becoming quite valuable in obtaining observance of safety rules by the entire school body. A complete manual explaining how to incorporate such a court in a school system is available.

*Safest Route to School*—A project on safest route to school has been sponsored by the club for many years. The idea is simple but very effective, particularly in the primary grades. Schools discuss the safest way for children to come to school and have them draw little maps. After the school teacher approves a particular route, each child takes his map home to his parents for their signature and information. Parents are asked to co-operate by walking the route with their children to make certain that proper protection exists. Maps for all school children are available without charge and a brochure explaining this project is also available.

*Bicycles*—The club suggests that every school become interested sometime during the semester in the bicycle program. In addition to bicycling posters, the club has safety rules printed in pamphlet form which are available to every student who uses a bicycle.

*Bulletins*—Bulletins and Safety Notes are also available and are quite valuable in rounding out a complete traffic safety program in the grade school system.

*School Signs*—Upon the request of a municipality, the club provides metal "school crossing" and "school zone" signs at the approach to dangerous crossings and school zones. It is recommended that these signs be used only at the time children are crossing. Signs are erected on easles. They are taken down after school hours.

In special cases where a high accident location exists, the Chicago Motor Club traffic engineering department is available to study these locations and make recommendations to the municipalities involved. Such studies include a complete analysis of past accidents and traffic conditions at these crossings.

### High Schools

The *major activity* of the club in the high school system relates to driver education and training. As a motoring organization the motor club has actively studied, developed and promoted this project for more than 15 years. The course being promoted by the club has been developed by driver training experts throughout the country including the work of the educational consultants of the American Automobile Association.

The club recognizes a course consisting of 20 hours of classroom work plus 8 hours of behind-the-wheel instruction. At the present time, there are more than 175 high schools in the motor club territory now conducting such courses. In addition to supplying schools with all necessary material and supplementary aids, the motor club has developed a plan whereby high schools could acquire a dual-control car without charge. Under this system an arrangement is made with local dealers which will provide a new car every year. The only cost to the school is insurance and maintenance—gas and oil.

Another service rendered by the club is the establishment of teacher training institutes for those teachers designated to instruct driver training. The course consists of one week of intensive training sponsored by some well known university in co-operation with the club and the AAA. In the past year schools were conducted at Purdue, Northwestern, Illinois and Ball State Teachers college. The only cost to teachers taking this training is room and board and transportation to and from the school.

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## The American Red Cross at Work in Milwaukee

By ORVILLE M. COX
Director, Safety Services, Milwaukee Chapter, The American Red Cross

The first aid and water safety programs have been in the schools for a number of years. It was just five years ago that we brought in the accident prevention program, and carried the three along together. In Milwaukee, we have separate committees for each of these services. These committees serve primarily in an advisory capacity.

Our program, of course, meets all of the standards of the American Red Cross, but probably the most important part of the program is that of instructor training and authorization. This involves, in water safety, a 30-hour course; in first aid, 45 hours of training; in accident prevention on the junior level, the new 6-hour orientation-type instructor training. At present, more than 400 teachers in Milwaukee county are authorized.

I would like to give you some of the details of one of our best programs. This happens to be in the parochial system of the Milwaukee Archdiocese of the Catholic schools. I met the superintendent of schools of this diocese some six years ago. We had a discussion one time in which we were trying to work out where, in the curriculum, a specific course in safety education might be placed. He quoted some figures I had given him, among which was the fact that 1 out of every 3 children who die, will die of an accident; and then he recalled that the dictionary definition, as well as the ultimate objectives of both health and safety, were synonymous. This meant to him that one-third of all health education should be in accident prevention.

At this point he reviewed the course content of health education in the schools and decided that the health course in both semesters of the eighth grade should be entirely on accident prevention. Then, it was decided that, as projects, the students of this health course in the eighth grade should be assigned to the other grades periodically, throughout the school year, for the purpose of disseminating safety information.

Almost immediately he set up, as a requirement, first aid courses in the first semester of the eighth grade. Then on a pilot program, 60 schools taught the junior accident prevention course in the second semester. Following this, all the eighth grade teachers were trained and qualified and authorized and ready to teach the following year.

No program will remain a program by simply pushing a button and then dashing off for new fields to conquer. From this standpoint, we in the Milwaukee office, are very concerned about continuing service to all the instructors who are authorized and to all of the courses in progress. Our service, in this instance, includes practically the whole list of accident prevention safety information and service. First of all, I will have to tell you that the workbook now used nationally was developed some three years ago in Milwaukee and ran through two printings in experimental form. From this experience, the new text was developed last year into a national publication.

In addition to the workbook used in the course, we take advantage of the many pamphlets, leaflets and posters available from any and all safety groups, and try to obtain them in sufficient quantity for student use. These are distributed by mail, monthly, to each of the courses in progress. Also, we have tried to obtain all of the motion pictures pertaining to safety and to make them available without charge. This also includes film strips on safety, which are made available to schools having film strip equipment. Also, we advise on speakers available for the different subjects and excursions, such as trips to industry and municipal organizations; and we consult regularly with the many teachers on current problems in the course.

I am convinced that no one person, in fact, no one organization, is going to make any major dent in the accident problem, by itself. With a problem as large as the accident problem in the United States today, if every single person and organization on safety got together and pulled together without regard for credit, we would still fall short of our goal. This means that there can be no petty personal prerogatives, that everyone must simply have one objective—that of saving lives—and forget the credit.

In line with this, in Milwaukee, you'll find the Red Cross very actively working in the school and home safety programs of the Milwaukee Safety commission; you'll find us active in the Home Safety division of the Wisconsin Council on Safety. We work continuously with the police and fire organizations in their prevention programs. We also co-operate completely with the health and safety committee of the Council of Social agencies, and, I must not forget to mention that we certainly take advantage of all the co-operation offered by the National Safety Council and use and recommend all of the materials it has available on safety. I know that in trying to give credit to co-operating organizations, I am going to miss some because there are many.

The first-aid program, in the school system, is primarily an accident prevention program. Taught in every high school in Milwaukee county, in the majority of the grade schools, is now offered at most of the colleges.

In the water safety program, where we are doing our best to waterproof the community and America, Milwaukee is fortunate. In Milwaukee county there are 52 existing facilities where there is swimming—both indoor and outdoor. The American Red Cross program is, at this time, carried on in 49 of these facilities.

For the benefit of educators I would like to state that I believe it's time that education got wise to the value of swimming in education. I think the ability to swim and the knowledge of swimming skills are the solution to the drowning problem. Swimming is much more than simple recreation. What good is it to highly educate our youth of today, bringing them into





adulthood without the simple skills necessary to save their own lives? I won't go into more detailed statistics on this. You have probably heard many times the staggering fact of how few Americans know how to swim. I will simply remark my hope, that some day I will see physical education—swimming—in the fourth, fifth and sixth grades of every school.

I believe all of you recognize how difficult it is to measure the results of safety education. We, in Milwaukee, have made one attempt in which you might be interested. In May, 1946, at the end of two complete years of required accident prevention work in the eighth grade of the Catholic school system, the Superintendent developed and distributed a detailed evaluation survey. This was a two-page list of questions each of which had to be graded excellent, good, satisfactory or unsatisfactory. Sixty-three schools reported on more than 2,000 students. Time will not permit a detailed review of all of the questions but, for example, the first question was "What, in your opinion, was the general student interest in this course?" Ninety-five per cent checked "excellent" or "good." Another question, "Was there a change in the attitude of the students toward hazardous activities and situations?" Here, eighty-three per cent checked "excellent" or "good." Another question was "In your opinion, has this course developed an appreciation on the part of the students, of their personal responsibilities in the elimination of hazards?" Seventy-seven per cent checked "excellent" or "good." While this type of survey, of necessity, is purely objective on the teachers part, we were quite heartened by the results, because they represented an independent survey within the school system. As a result of this survey, the superintendent commented, "There is no question about the permanence of this kind of program in our system."

I believe the safety of our nation is in the hands of the next generation. If this be true, tomorrow's safety is in the hands of our schools and colleges today.

## The National Congress of Parents and Teachers—At Work in Georgia

By MRS. FRED KNIGHT
Georgia Congress of Parents and Teachers, Cartersville, Ga.

Lucky you!

You weren't one of the 32,300 persons killed in automobile accidents last year. You weren't among the 94,500 accidental deaths in 1943, although some of you may have been among the nearly 10,000,000 injured.

These figures should be alarming! But the average American reads them and shrugs them off. And yet, if a disaster should befall one of our cities, such as Hiroshima felt, it would be a day of national mourning. The loss of life is not all that is involved, the economic losses in money and hands and minds lost from production also affect each and every one of us.

All great movements depend on intelligent leadership and hard work. The safety movement is no exception.

During the period from attack on Pearl Harbor until V-J Day, military losses included 261,608 killed, 651,911 wounded, and 32,811 missing. Appalling as these statistics are, they cannot compare to the accident toll on the home front. Over the same period of time, accidents were responsible for an even greater waste of life and efficiency—355,000 killed and 36,000,000 injured.

It is apparent that we are not meeting our responsibilities in the field of safety. We have the responsibility of finding out why this is true and of doing something about it.

Even though individuals cannot completely isolate themselves against accidents, organizations such as the P-TA and others can, through local units, secure support for safety education, good engineering, and adequate enforcement of all safety regulations.



The committee on education of the President's Highway Safety conference defines the problem thusly: "Safety represents the efficiency of adjustments man makes to his total environment." It is apparent then that safety education, which is developing the knowledge and skills that make for safety, must be a part of the long-range program at home, in the elementary schools, and finally in our high schools and colleges. Since a safe environment is essential not only to the individual but to his fellow man, safety must also be a part of education for world citizenship.

To reduce the frequency of accidents in home, school and community, the P-TA in Georgia is attempting to do three things:

1. To educate P-TA members and the general public into awareness that accidents can and must be prevented.

2. To understand and co-operate with school safety programs.

3. To co-operate with all officials and agencies concerned with safety.

A local P-TA safety committee, headed by an efficient chairman, can and should take the lead in launching the march on accident prevention. Its aims should be to help both adults and children to live happily, abundantly, adventurously, yet always safely. I think this program should be based on the attitude, "It's Smart to be Safe," instead of the old "don't" attitude of fear.

We know that organizations such as ours can do much to interpret to the public the philosophy and objectives of the safety education program by assuming these responsibilities:

1. Encourage children to belong to school safety patrols, 4-H clubs; to set up school safety courts or leagues, student safety councils; and aid them in their organization of school safety patrols.

2. Urge the inauguration of a driver training program in the high schools.

Equally important is the responsibility for co-operating with the community safety programs through:

1. Supporting any enterprise connected with the maintenance of highways.

2. Establishing driver clinics and traffic violators' schools.

3. Sponsoring brush-up courses for school bus drivers, and seeing that these drivers are paid high enough salaries to assure getting good drivers.

4. Supporting the recommendations outlined in School Bus standards.

The following activities stress home safety in connection with children of preschool age:

1. Urge home demonstration agents to discuss with parents the importance of safeguarding the preschool child from the dangers of ordinary household equipment.

2. Discuss with teachers of kindergarten and preschool groups, such topics as safe toys and how to use them safely, safe places for children to play, and related topics.

3. Co-operate with the Red Cross in all programs of home nursing and first aid, especially the demonstration of first-aid kits.

4. Map out safe routes for children who walk to school, particularly those attending the lower grades.

Special study courses in home safety are very effective and could take one of these forms:

(a). An eight or ten-week course in home safety, including the care and upkeep of household equipment, the prevention of fires, safe methods of canning and dehydrating, and other problems of home safety.

(b). The integration of material on safety education into regular P-TA courses of instruction in social sciences.

(c). Education in the responsibility of the individual to observe fundamentals of safety.

Other activities of the safety committee might be as follows:

1. Ask each member of the committee to survey her home for unsafe conditions and practices. Then summarize these reports and compile a home safety check list for distribution to the entire membership.

2. Urge the town registrar of vital statistics to release figures on fatal home accidents in the community. Hospital reports on nonfatal accidents are also very useful for publicity purposes.

3. Encourage a school project on home safety. The P-TA might supply students with mimeographed check lists for noting home accidents of all types.

*Suggested P-TA Programs*

I. *Topic—Safety in the Secondary Schools*—A special meeting on the value of driver education and training might include a discussion of (1) the cost of this type of program; (2) its place in the curriculum; and (3) the advantages of such training for citizenship.

II. *Topic—Home Safety*—The problem of home safety is not spectacular and, therefore, must be dramatized. To break the ice, open the meeting with the National Safety Council's sound film, "Home Safe Home." Then present the report of a community survey that deals with unsafe conditions and practices in local homes, with suggested methods of eliminating these dangers.

III. *Topic—Safety Equipment and How to Use It*—Ask the head of the local fire department or an industrial safety engineer to demonstrate the correct use of the fire extinguisher and directions for behavior in case of fire.

The Georgia Congress of Parents and Teachers is recommending a restudy of the present laws and provisions for adequate protection for all children of Georgia attending the public schools, with special reference to fire and traffic safety.

The number of American high schools offering driver training courses almost doubled during the past school year. The students enrolled in this type of training almost trebled. Through the co-operation of the Georgia Institute of Technology, we have initiated a state-wide program in Georgia which is gradually being adopted in almost every school center. As one of the main objectives of the P-TA, this safety training is now reaching the local level.

It is an accepted fact that young people with instruction in safe driving are involved in fewer traffic accidents than are those without the training. This driver education tends to develop a safety consciousness which is reflected in all other fields where hazards occur. The youth learns to live safely in this modern, mechanized world by acquiring properly adjusted safety habits and attitudes.

This safety training is a long stride toward the eventual total reduction of preventable losses of life, limb and property.

We must, however, face the fact that much more still needs to be done. We must, somehow, acquaint everyone with the hundreds of potential hazards faced each day. Working with our P-TA groups, we believe that we have the greatest opportunity of any organization to do just that.

## The Lansing Plan for Accident Prevention

By HAROLD F. LILLIE
*Director, Lansing Safety Council, Lansing, Mich.*

Enforcement is left entirely where it should be, in the hands of the police department. All programs of enforcement are designed by them and are given the support of the people.

Traffic engineering is done by the traffic commission which is headed by a traffic engineer. The commission is made up of citizens appointed by the mayor and city council, who receive no compensation for their services on this committee. Their job is to recommend to the city council any changes or improvements in traffic lights, street markings, street design and parking control.

Classroom education is done by the public and parochial schools of Lansing and East Lansing and they are never told how or what they must teach. A committee composed of teachers actually doing classroom teaching is appointed by the superintendent of schools. This committee is responsible for designing the program of instruction. The teachers on the committee meet once a month for a general meeting and then break up into project committees which actually do the job. Safety education is taught in this community from the kindergarten through high school. Safety education has now grown to such an extent that small communities around Lansing are asking for assistance from our committee to help facilitate safety education in their schools.



During the school year 1947-1948, the Lansing school committee worked toward three main objectives; increasing the safe characteristics of the school environment; stimulating greater attention to safety education on the part of parents, educators and the public; and providing teaching aids and pupil materials for safety education.

Of the many aspects of school environment safety which were studied and discussed during the year by the committee, fire safety received most attention. Following a study of the fire drill practices in schools and the hazards present, a detailed report and recommendations were filed with school authorities. This project was carried out with the active co-operation of the Lansing fire department.

Pupil accident reporting continued to be a major concern of the committee during 1947-1948. Results of experiments with the standard student accident report blank led to the development of an original report form combining the desirable features of the former and also those of the local school blank. A recommendation for the adoption of this form as the official accident report form and also for the establishment of a definite system of pupil accident reporting was filed with the superintendent of schools this spring. It is hoped the program may be in action this year. This committee continues to feel that a good system of reporting pupil accidents is a necessity.

Although the committee concerned itself with many aspects of school safety during the year, perhaps its greatest contribution again has been as writer, publisher and distributor of printed materials. Some 65,000 pieces of original printed materials were published and distributed during the year. This was in addition to all of the materials included in the National Safety Council school memberships. These, supplied to more than 40 schools in the Greater Lansing area, include monthly lesson units and posters, magazines, books and other safety education helps.

The original materials served as integral parts of projects fostered in the schools by the committee. In October, the committee helped sponsor a hunters' school. Tickets of admission were distributed among junior and senior high school pupils and schools were urged to devote some school time to hunting safety.

Just prior to the December vacation period all elementary pupils received a safety Christmas card. These were attractively decorated and carried an assortment of verses each pointing up some common holiday hazard. They formed the central focus for classroom lessons.

In March a "Do You Know" folder was similarly distributed and used to promote street safety. It was based upon Lansing's accident picture.

Earlier in the year the committee distributed a large accident record poster form to all elementary rooms. These have slots for changing pictures, dates and accident totals, and have served as a continuous reminder and safety focus for the pupils during the year.

Bicycle safety has received a large share of the committee's attention. A blotter, printed at one of the junior high schools in the fall and financed by the committee, sets forth the rules and regulations for riders. Late in May, all junior and senior high pupils received a blotter, "Lansing's Box Score," carrying a June calendar. The message pointed up the traffic accident injury and death score and asked, "What are you doing to make it lower?"

Upper elementary and junior high school homerooms were supplied with bicycle maintenance and safety posters and pamphlets. This distribution came as the annual bicycle licensing program was being completed in May. Teachers and principals were urged to take this opportunity of stressing bicycle safety before school closed for the summer.

Playground safety was promoted in June with a double-barrelled project. Elementary pupils all received a safety card listing the names of supervised playgrounds and pools to be open during the summer and a "Safety Game" circular. This consisted of a large pencil drawing, suitable for coloring, of a playground scene on which 10 unsafe acts were being committed. These formed bases of excellent lessons.

A unique project aimed at helping parents do a better job of teaching their children to drive was carried out in June.

Parents of Lansing pupils between the ages of 15½ and 16 were mailed copies of the booklet, "Behind the Wheel," which outlines very clearly a few fundamental lessons in teaching someone to drive. This was accompanied by a letter, copies of "What *Every Driver Must Know*" and "Digest of the Lansing Traffic Ordinance," and a blotter listing "Seven *Keys* to Safety," the latter produced by the committee. This project has been aided by the *Lansing State Journal* which has run a series of safety articles.

Through the education division of Michigan State college, the committee supplied safety education materials and information to student teachers for individual projects.

The point of view that driver education and training should be offered in senior high schools is still held by the committee. Textbooks for such courses, as well as supplemental *materials, tests, and films,* have been supplied to four schools. Dual control automobiles were provided for two of these schools.

The safety patrols are co-sponsored by the Board of Education, the Police department, and a committee appointed by the president of the Lansing Safety Council. The schools choose the youngsters for safety patrol duty and see that they are on the job. The Police department furnishes a full time officer with the rank of sergeant to supervise these patrols on the street. The Greater Lansing Safety Patrol committee raises and administers the funds to pay for all equipment, awards, annual picnic, etc. The committee has the services of the national advertising director of the *Lansing State Journal* who serves as campaign director in the raising of the funds.

The Lansing Safety Council has the important job of selling the public on good enforcement, education and engineering. For example, when the Police department decides to go out on a program of strict enforcement, such as our present pedestrian enforcement program, it is the job of the safety council to educate the public as to why pedestrian enforcement is necessary and to be sure that the police department receives the backing of the public.

The community safety program receives the 100 per cent support of the press and *radio.* Last year the *Lansing State Journal* allotted more than 14,000 column inches of newspaper space to safety, and this year the allotted space will be even greater. The two radio stations, WJIM and WILS, are continuously broadcasting safety messages to the public through spot announcements and public service programs.

We feel in Lansing that the Lansing plan is not a difficult one and that any community can scale the program up or down depending upon the size of the community.

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## How We Utilize the Services of National Organizations in Our School Safety Program

By D. WILLARD ZAHN

District Superintendent; Chairman, Committee on Safety Education, Public Schools, Philadelphia, Pa.

*Unsafe practices anywhere ultimately affect almost everybody everywhere. Therefore, safety responsibility must be shared; and safety activities must be shared enterprises.*

Many national associations have done a marvelous job. One of the most promising developments in the safety field is the increasing understanding and co-ordination on the national level. When this kind of understanding permeates the local communities, then we'll attain results!

The Philadelphia school system is a large one—its 500,000 parents, 8,500 teachers, and a multiplicity of organizations include all shades of public opinion. As a school system, Philadelphia has invited participation of all agencies for the common good.



The Philadelphia Safety Council co-operates with the schools. A subcommittee is now producing the following flyers:

Safety Helps (The Patrol)
Springtime Safety (Seasonal)
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We have gone "all-out" for joint activity with the local safety council.

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Participation in the A.A.A. Poster Contest has been approved and is now traditional at the secondary level. With much help from the A.A.A. we have inaugurated a complete program of driver education and behind-the-wheel training.

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The Psychology of Accident Prevention
Safety in the Elementary School
Safety in the Junior High School
Safety in the Senior High and Voc.-Tech. Schools
Driver Education
Community Co-ordination

Persons taking the Seminar were representatives from the administrative districts or school levels of the entire system.

*The American Red Cross*—A member of the safety committee is designated as the liaison with the Red Cross. His function is to bring to the committee Red Cross programs and activities, which in turn are adapted to local usage either by curriculum committees or the safety committee itself.

Our health division is in direct contact with the American Association of Health, Physical Education and Recreation. The safety factors of the health curriculum reflect their practices and standards.

The development of safety standards is reflected in the Industrial Arts Shops because of the activity of the American Industrial Arts Association.

The National Board of Fire Underwriters is privileged to distribute their full complement of materials for Fire Preven-

Parents of Lansing pupils between the ages of 15½ and 16 were mailed copies of the booklet, "Behind the Wheel," which outlines very clearly a few fundamental lessons in teaching someone to drive. This was accompanied by a letter, copies of "What Every Driver Must Know" and "Digest of the Lansing Traffic Ordinance," and a blotter listing "Seven Keys to Safety," the latter produced by the committee. This project has been aided by the *Lansing State Journal* which has run a series of safety articles.

Through the education division of Michigan State college, the committee supplied safety education materials and information to student teachers for individual projects.

The point of view that driver education and training should be offered in senior high schools is still held by the committee. Textbooks for such courses, as well as supplemental materials, tests, and films, have been supplied to four schools. Dual control automobiles were provided for two of these schools.

The safety patrols are co-sponsored by the Board of Education, the Police department, and a committee appointed by the president of *the Lansing Safety Council*. The schools choose the youngsters for safety patrol duty and see that they are on the job. The Police department furnishes a full time officer with the rank of sergeant to supervise these patrols on the street. The Greater Lansing Safety Patrol committee raises and administers the funds to pay for all equipment, awards, annual picnic, etc. The committee has the services of the national advertising director of the *Lansing State Journal* who serves as campaign director in the raising of the funds.

The Lansing Safety Council has the important job of selling the public on good enforcement, education and engineering. For example, when the Police department decides to go out on a program of strict enforcement, such as our present pedestrian enforcement program, it is the job of the safety council to educate the public as to why pedestrian enforcement is necessary and to be sure that the police department receives the backing of the public.

The community safety program receives the 100 per cent support of the press and radio. Last year the *Lansing State Journal* allotted more than 14,000 column inches of newspapir space to safety, and this year the allotted space will be even greater. The two radio stations, WJDE and WILS, are continuously broadcasting safety messages to the public through spot announcements and public service programs.

We feel in Lansing that the Lansing plan is not a difficult one and that any community can scale the program up or down depending upon the size of the community.

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# How We Utilize the Services of National Organizations in Our School Safety Program

By D. WILLARD ZAHN

District Superintendent; Chairman, Committee on Safety Education, Public Schools, Philadelphia, Pa.

*Unsafe practices anywhere ultimately affect almost everybody everywhere. Therefore, safety responsibility must be shared; and safety activities must be shared enterprises.*

Many national associations have done a marvelous job. One of the most promising developments in the safety field is the increasing understanding and co-ordination on the national level. When this kind of understanding permeates the local communities, then we'll attain results!

The Philadelphia school system is a large one—its 500,000 parents, 8,500 teachers, and a multiplicity of organizations include all shades of public opinion. As a school system, Philadelphia has invited participation of all agencies for the common good.



The Philadelphia Safety Council co-operates with the schools. A subcommittee is now producing the following flyers:

Safety Helps (The Patrol)
Springtime Safety (Seasonal)
Safety in Summertime (Seasonal)
Safety in Snowtime (Seasonal)
Sled Safety
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The National Board of Fire Underwriters is privileged to distribute their full complement of materials for Fire Preven-

tion Week and to work with the buildings department on standards for building construction and maintenance.

The National Commission on Safety, National Education Association, serves a valuable purpose through attractive and well-written pamphlets covering safety at all levels and for all topics. In the establishment of our outline for a new city "course" and in developing a syllabus at the state level, the N.E.A. publications provided a most satisfactory base.

I have not mentioned all the evidences of use which we make of national organizations: I suspect there are activities about which I do not know.

Information about safety is not enough! Participation effort alone is not enough! The safety program must be built upon parallel and continuous development along both national and local lines—co-operative planning and co-ordinated development.

The national associations concerned with safety play a peculiarly important part in this process. Let's use them for all they're worth!

# *Officers of the* SCHOOL AND COLLEGE CONFERENCE

## NATIONAL SAFETY COUNCIL 1948-49

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# THE HUMAN SIDE OF SAFETY

**As Presented in the Early Morning Sessions of the 1948 National Safety Congress Under the Title, "More Psychology You Can Use."**


Some Thoughts for Management Men ..... 4

Some Thoughts for Today ..... 9

Some Thoughts for the Future ..... 15

Some Thoughts for Yourself ..... 21


**Volume 34**
**Transactions**
**1948 National Safety Congress**

GREEN CROSS FOR SAFETY

# What's New...

In safety, as in all other human activities, the question is repeatedly asked, "What's new?"

Many answers to that question are given every year by those who participate in the various sessions of the National Safety Congress. Many new methods, devices, and ideas which later became generally accepted first were presented at a Congress session.

Because of this fact, safety directors throughout the nation have always found the Transactions of the Congress a valuable tool in their accident prevention programs. Publication of the Transactions in small volumes—one for each Section or Division—permits wide distribution of pertinent portions of the Congress material to management and supervisory personnel at small cost.

The 34 volumes of the 1948 Congress Transactions are listed on the last page. Distribution of these volumes to key personnel is suggested as a valuable aid in the safety program.

In preparing these Transactions the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants, and not necessarily those of the National Safety Council.

## THE EARLY MORNING SESSIONS

This volume is a record of the Early Morning Sessions held at the 1948 National Safety Congress. These sessions are addressed each year by a nationally known speaker who has a message of general interest to all those attending the Congress. Dr. J. L. Rosenstein, Consulting Psychologist and Associate Professor, College of Commerce, Loyola University, spoke at the 1948 sessions.

# Some Thoughts for Management Men

By DR. J. L. ROSENSTEIN
Consulting Psychologist and Associate Professor,
College of Commerce, Loyola University, Chicago

Sometimes in getting around the country you get an idea. As a matter of fact, if you go around to various plants you will find something like this. Nobody ever wants to wear safety goggles because they fog up and get grimy and dirty and then somebody loses an eye and then you can sell safety goggles.

Nobody wants to wear safety shoes. Then somebody loses a foot and then you can sell the fellows and the girls on the idea that they should use safety shoes.

Down at the Safety Council they think I am crazy (because I am sure one or two of them think I am serious about it), but at any rate, they say I am crazy because I suggested I was going into business and organize a service organization providing a special service for safety directors in which I would have a staff of pretty nice looking men and women.

They could be hired at so much a year on a contract basis, and they would go into plants and lose eyes and arms and legs and then everybody would use safety equipment and follow safety rules, and none of your employees would get hurt.

The fellows at the Council said I was silly because there was no future in it. At any rate, it would be nice, though, wouldn't it, if there were some such thing?

There is an old saying that "it is far more important to know what kind of a patient has a disease than what kind of disease the patient has," and I think that could well be the text for this morning's discussion.

We study and are authorities and become expert in every phase of safety and every aspect of the safety problem except the one which is common to every single serious accident; that is, the human being in the accident. There is always a man in the picture.

But to you I would say, "Well, that is a terrible thing, but it is only a symptom. It is not the disease." The true disease, so far as I can see, lies in the belief on your part, on management's part, that personnel work belongs in the personnel department and that labor relations belongs in the labor relations division. When personnel work is done right on the job every single hour and every single day, it is of necessity rule of thumb stuff, because the supervisor has never been taught proper personnel methods. It is my thought that every supervisor should get the kind of thorough grounding in good personnel practice that you will find in any good text book on personnel practice and administration.

In all the plants you know, including your own, how many foremen, supervisors or even executives have a thorough grounding in the principles of scientific selection and placement of workers or the proper methods of induction and training? How many are familiar with job analysis or job evaluation or employee rating or discipline or up-rating or down-rating or termination interviews or the true bases or principles for the bases behind wage policies and wage administration? How many know about time study or motion economy or work simplification or setting of standards or setting of rates or employee services or health conservation or getting suggestions or understanding thoroughly the union contract provisions so they can explain them to others or employee counselling or incentive plans?

Here is the old problem, just as old as history itself: responsibility without the proper background for dealing with that responsibility. In my opinion the great hazards in industry are not with employees or workers alone. One of the great hazards is haphazard supervision.

Don't you think that the supervisor is a normal person who worries, has his own problems and his own troubles? If you are one of them, don't you—if you are one of the older ones—have a sense of insecurity, subconsciously, and maybe consciously, or a sense of inadequacy? How can you help but feel insecure? About 25 years ago your average worker may have had four, five, six, or maybe even eight years of schooling. It was a rare one who ever went to high school. Today they are fast becoming a 100 per cent high school educated group.



Moreover, they are learning how to read and how to listen. They are smarter and wiser and better educated and more intelligent than the ones that started to work from school 25 years ago. The present supervisor cannot deal with these people by the old rule of thumb any more. They are analyzing, not just accepting. They are thinking, not just passively receiving. They are taking you apart every minute of the day when you are handing out instructions or giving orders or directing them.

In order for the supervisor to stay ahead of his men, he needs scientific training and continuing self personal growth, self-analysis, education, technical and psychological understanding and background.

With scientific planning taking much out of his control, the supervisor has very little by comparison to the old time supervisor to say about his job. He has become primarily an activator of other people's ideas, other people's rules, other people's principles, other people's methods rather than a creator of ideas.

However, there is one thing they have not taken away from the foreman. They can take selection, hiring and firing, production and planning out of his hands. They can take grievances and discipline and so on out of his hands because of contracts. But he still has the most important job in the world—that of dealing in human relations. That is his function and will more and more become his function. He is becoming an expert in human relations or is a poor supervisor.

But human relations begins at home and maybe an examination or understanding of one's self might be a proper background. If you are going to lead or supervise others, if you expect respect in the eyes of the worker, you cannot get it by force any more. You have got to be just a little bit better man than the fellows whom you are leading and a much better man than you ever were before.

But you know, and I know, that you cannot think bigger without bigger ideas, and you cannot have bigger ideas with the same old information and background. You cannot think broad with a narrow background. You say, "All right, I am willing—what can I do about it?"

The answer is that you might get a broader background by studying some of your company programs and developing these programs. You can go to night school or take correspondence courses. You can go to the library day after day and continue to get books and read various articles in trade journals, personnel journals and management journals. Sure, you can do that.

But here is where I have a strictly personal "gripe," and I might just as well give it to you. Maybe you will spread it around the country. It goes something like this. A great many companies have what they call employee outings or picnics. Who wants these outings? I have talked to a lot of employees that say, "Cripes, I wish we didn't have to go." Haven't you heard it—or aren't you aware of that? Or they have company dances for the employees. Who in the heck wants company dances? I have heard them say, "Cripes, I wish I didn't have to get dressed and go out there tonight. I don't want to go to that party."

I have never yet heard of a wife of any employee who has wanted to go or who has enjoyed herself at any company picnic or company dance. Maybe I don't meet the right wives!

Then of course, once a year the company has a Christmas party. Well, who wants a Christmas party? You want to go home. You don't want to just kill a whole evening or a whole day at a Christmas party at the plant. You want to be with your family.

These are wonderful things, but who wants them? Do they satisfy only the ego of management — somebody upstairs who has a bright idea? It costs money to put on these things. I wonder whether your company might not profit more, if instead it were to arrange for the foreman and supervisors once a week or once a month to get out of the plant and go to one or two other plants and see what is going on. Let them see how other fellows are handling their problems. Get some actual first-hand contact with other men who have similar problems.

Do you think that you can be a better man by staying in your own department forever? Don't you think that you can learn from contact with others, from the experience of

others, from seeing how others are doing things? Don't you need *inspiration*? Sure, all of us need inspiration. If you can learn *from others*, so can every one of your supervisors learn from others. Why don't you send them to various other companies in your own communities or in your region or in your area, to conventions on company time at company expense with the idea of using something which is good and practical and has *been found* to be worth while.

There is only one reason for your being here. You want to get together at least once or twice a year with other people who are in similar work and talk over common problems. You should be doing that every day or every week or every month.

Do you mean to tell me that your machinist knows so much that he cannot learn something from visiting at some other plant? You know, every machinist learns his trade, and yet as he goes along he picks up little tricks and develops his own little ideas. If that is true of your machinist, it is also true of machinists in other plants and your machinist can learn from them or your dye clerk or any employees who are doing skilled work, even if the fellow mops the windows. He might learn something about washing floors or windows in some other plant.

Why not invest in the growth and development of the people in your organization instead of trying to give a little entertainment. It will be as effective as these Christmas and Thanksgiving baskets that use the principle of—Let them starve all year and then give them a boatload for a day.

It may be true that a happy worker is a better worker, but it is far more true that a better worker is a happier one. Are you happy doing anything at which you are incompetent? Don't you get more kick out of doing things smoothly, efficiently, and knowing what you are doing, knowing how to go about doing what you are doing? What about the fellows who work with you or for you?

Wouldn't it be wonderful if workers didn't have to be supervised? I think that *is a wonderful Utopia* to dream about and aspire to.

*The better management is the one which* does no managing. That is a wonderful dream. Is it possible to work out such a thing? You don't have to supervise the man who knows what is expected and how to do what is expected. If it is true that the truly skilled worker needs a minimum, if any, supervision, it is only because he has been properly trained. "Skilled" refers to the ability to do a job.

Is there any reason why every worker on every job cannot be so trained *that on his* own job, whether it be sweeping floors or running a press, he too will approach that Utopian worker who needs no supervision? The best supervision is the kind that does not need to supervise, and no supervision is needed only when people know what is expected of them and know how to go about doing what is expected of them.

When people come to you and ask for money for such worthy purposes as the Red Cross or Community Chest or some worth while charity, they have something worth while to sell, don't they? A fellow's responsibility for his fellow men and his sense of responsibility for these others is a symbol of his own adulthood. He has grown up.

But even though you know that the Red Cross and Community Chest are important and vital and worth while, somehow or another you have got to be pushed. You will say, "Okay, I will give 5 or 10 bucks —that's all I can afford.", Then they say, "Look, you gave $10 last year. We have got to *have $15 this year.*" It is a struggle and maybe they will get it and maybe not, primarily because the appeal is a general one. It doesn't seem to reach you because it isn't meant for you. It is meant for everybody but for nobody in particular.

But if somebody were to come over to you and say, "Bill, we want $20 from you." You ask what he wants it for because that *is a lot of money* out of your pocket. "Well, there is a kid down the street about eight blocks away and she is an awful cute kid. But she can't walk—she needs a pair of braces. Her family is poor and her mother is out every day trying to support her. Tom and Dick and Harry and I are going to contribute $20 apiece to buy that kid a pair of braces, and when you come down and see when she puts those braces on for the first time and can stand for the first time, it will be worth twenty bucks."

So you say that twenty bucks is more than you can put out, but he has not reached your pocket. He has hit your heart. You wouldn't say you couldn't do it. You might say that twenty bucks is tough, and you will give it. You would do it and so would I. That is a personal appeal, and it reaches me and you directly where we live.

How about safety? How about safety or any other program? Are they general or are they meant for each man himself, directly and specifically, not just safety but me! Do I feel that every activity that is related to safety is for me alone, not for the other two or five or seven men, but for me?

A little later on I will mention something about the films the Safety Council has just completed. They are wonderful—I helped in their preparation. [Laughter] In order to make sure that we were not going too far afield, we called in several people from different plants and said, "Now you fellows are the ones that are going to be using this stuff, and you are going to have to decide whether it meets your needs. If it is not good, we will throw it out."

One of the fellows from General Motors told me that they cannot get enough individuals to talk safety to all the men. They would never have enough people to get around to all the workers. So they used *this idea.* Every supervisor, every single day, without fail must talk to two people individually about safety. He must keep a record of the person to whom he has talked, what he has talked about. It would not have to be much—maybe take a minute or two, maybe five minutes, or maybe a half hour if necessary.

They do not have any big meetings, no general stuff. *It is strictly* personal, and they get real teamwork from that kind of individual stuff. Just as on the football team, everybody is taught the general principles of football, but in addition to the general principles, the line men are taught line football, the kickers are taught about kicking, the passers are taught about passing and the backfield men are taught about running and carrying balls. In the same way the continuing and abiding principles of safety should be taught to everybody.

But every man should be taught. You should talk to every man and educate and train him in terms of safety as it relates to him—safety on his specific job, safety on his specific operation, safety in his *specific department, safety as it refers to* him. You know what happens with people. You get a crowd together and those in it can be rowdy as the dickens and hard to handle. Yet if you take any member of that crowd and pull him over and talk to him, you cannot believe that he is one of that crowd. *He is a totally different person.* You are reaching him in person—in his heart and mind. Teach safety in groups, but teach men individually.

Management reminds me sometimes in its performances of the man who has not kissed his wife for maybe five years but who resents it if he finds anyone else kissing her. He says, "She is mine and that is my prerogative.

What is management's prerogative, or does management have any? Management has only one prerogative and one abiding principle for existence and function, and that is to so operate a business which has been entrusted to management by the owners or stockholders so that the greatest profit possible accrues to the owners of that business. That is management's only prerogative!

In order to live up to that prerogative and conform to that prerogative, it is, therefore, management's prerogative to select and train employees properly. It is management's prerogative to analyze thoroughly and study carefully the effect which every rule and every policy and every practice will have on the feelings and attitudes of every worker.

It is not management's prerogative to say that the worker be damned or to pamper the worker. It is management's prerogative to say that the effect of what we do on the worker affects the profit of our company, and therefore we must consider seriously what the effect of what we do will be on the worker's efforts.

Management must remember that everyone wants to participate in the planning of those activities which will affect his job, his income, his working conditions, and his security. It is management's prerogative not only to provide the worker with the job, but also with a sense of security and freedom from worry. It is management's responsibility to not only be fair, therefore, in its dealings with the worker but to have every appear-

ance of being fair so that every worker knows and believes that management is fair.

It is not management's prerogative to quarrel with society. Management may be opposed to the union principle, but if it is to profit and work to the advantage of the owners, management should deal with the union as a part of realistic industrial living and not waste company money planning military and legal campaigns to beat the union.

It is not war, but peace, which provides for growth and progress. Maybe you wish to interfere with management, and maybe not, but management *might well* examine itself to discover to what extent the mere existence of a union has been made the poor excuse for bad ethical practices and worse human relations practices.

It is management's prerogative at higher levels to use what is commonly called consultative management. It could consider a program which might be called consultative safety.

Management has always used special incentive plans by which a share of additional profit from extra employee effort has been returned to the worker. That is the basic principle of the incentive plan. It is, therefore, management's prerogative to consider a safety incentive plan in which a portion of all the money saved as a result of accident reduction might be returned to the worker.

Management should recognize that safety is a monetary concern of the stockholder, *but that it is of more serious concern to* the worker. It concerns his life, his home and his whole future. It is management's prerogative to recognize that safety is the worker's program and should not be a management program in which workers are asked or begged or cajoled or threatened or forced to cooperate. It is and must be a worker's program in which management will cooperate by offering complete financial and technical help in the same way they offer technical help to the employee's credit union but do not control it. Safety is a worker's problem financially, emotionally, physically and socially. It is management's problem only financially.

Management must sell its programs, whatever they may be, plans and policies to the worker. Since he is a special type of customer for a special kind of product, a special and separate and distinct sales department, separate and distinct from personnel and separate and distinct from labor relations, must be established to sell to him.

It is management's responsibility to provide security for the workers. Society demands it. But it is management's prerogative to shout out loud that responsibility without authority must never be accepted as a principle of democratic life.

If the worker demands that management assume the responsibility for his security, then it is management's prerogative to demand the authority which is necessary to provide that security. Men and women who, because of intellectual or emotional immaturity, cannot practice ordinary thrift or use common sense in planning for their own security, who are themselves irresponsible, should not expect management to assume that responsibility for them.

Such a principle would be so obviously unfair to the intelligent, thrifty and industrious workers of the nation.

It is management's prerogative to recognize that the selection of future workers, leaders and supervisors starts too late. It should begin in high school, not at the time when boys and girls apply for jobs. The raw material is the high school student. Just as you follow, inspect and watch over any raw material that enters your plant you should inspect and watch over this raw material. An industrial civics should be taught in high school which will teach every boy and girl the meaning of the triad of duty and responsibility: (1) the duty and responsibility of every worker to his management and to his union, (2) the union responsibility to the worker member and to management and (3) management's responsibility to the worker and the union.

He should be trained in advance in the principles of industrial safety, and he should be trained in advance in the problems of labor relations before he gets out of high school. You know, everybody worries about what is on the worker's mind, and finally we have management's duty to recognize that supervisors and executives are people, too.

They are not perfect, either, and they have troubles, too. They have things on their minds and they need understanding. Their



relations with their management should also be human relations.

MR. HARTIG [Oregon]: When you speak of foremen and machinists and others going out to other plants, you mean, of course, on company time.

DR. ROSENSTEIN: When I speak of machinists and foremen and others going out to other plants, do I mean on company time? I certainly do—on company time and at company expense, including, if there is no cafeteria in the plants, the price of a heck of a good meal and taxicab and tips and everything else that goes with good management [applause] because that extra $5 or $10, or even $25 can, if properly used, bring back with that foreman a $1,000 or $10,000 worth of knowledge and information—not for him, but for the company. I don't like to spend money, but I surely love to invest it and I think when you give it to the foreman in those terms you are investing it.

## Some Thoughts for Today

Today I would like you to do a little day dreaming with me. It is through day dreaming that we sometimes get ideas that develop into something worth while and practical.

For example, if I were a safety man, I would sometimes day dream—"wouldn't it be wonderful if we could walk around the shop and predict an accident a week or month or six months before it happened?" Of course it would be wonderful. How could you do it? I don't know how you could do it, but let's kind of kick the idea around. Let's do some daydreaming about it.

Let's start out from the beginning with the things we already know. What is an accident? We say that an accident is something that nobody wants to have happen. All right, an accident is also something which could have been prevented if we had known some things and done some things which we would have wanted to do.

Furthermore, an accident is a situation in which either a person is hurt or some material is damaged or destroyed. That sounds like a very ever-simplified description of an accident.

I say, "Wait a minute. Is there anything that sounds like it might fall in the same category?" If I should go to your shop, and ask if you have some pretty good workmen around, you would say that you do. If I ask whether you have some that are not so good, you would say, "Sure."

What do you mean—good or not so good? You mean the fellows who are good *now and then*, but don't always do their work properly. They are the ones who have a lot more scrap and more spoilage than average. Things happen to their equipment, tools, and materials. We then say with regard to these fellows, "Would they have prevented that excessive waste if they could have?" The answer is, "Yes."

Is there anybody who wants to have it happen? No. Is work or material spoiled? Yes. Wait a minute! Isn't that just how you described an accident before? Is there a relationship between scrap, production and accident rate?

We study production in terms of quantity of good acceptable material produced, don't we? That is what we are thinking of. We are worried about scrap in terms of cost and things thrown away and money lost. Have any of you ever taken the time to make a study of the relationship which might exist between scrap production and accident rate? Is there a relationship? I don't know—I am just wondering. Does it sound like something we should look into? If there were a relationship between scrap ratio and accident ratio, we could predict that a worker who does certain things would have an accident waiting for him around the corner, because he is producing little accidents every day. They are just little accidents in which he is not hurt, because he does not spoil material deliberately. He does not get scrap deliberately. Yet he is in the scrap production business. He is in the material spoilage business. He is in the accident production business.

I wonder if you might take that home

and think about it. You might get something out of it. I don't know. I am just day dreaming.

We do *know* that machines are almost foolproof. The major job of the mechanical and industrial engineer is to build safety into equipment and jobs. You build machines from scratch and you start out with an idea and put it down on paper and convert that into a machine or something else. You can build into it all the qualities you want because you start from scratch.

But when we get our workers, they are 18, 20, or 40 years of age, and they sometimes have had 5, 10, or 20 years of working experience. We had very little to do with their mental and physical equipment except to accept it *for what it is* and try to learn what it is and in some little fashion try to reorganize it so that it functions toward our ends.

So it is this human factor which is prebuilt with which you have to deal, and maybe we ought to do a little day dreaming about this human factor.

If you were to come to me and say, "Dr. Rosenstein, do you think you are perfect?" I might lower my eyes modestly and say, "Well, of course, no one is really perfect." If I were to ask you that question, of course you would express yourself in the same fashion. If you are not perfect it means there is something lacking in your makeup somewhere, something lacking in you. None of us expects to achieve perfection, and I am not sure we want to achieve perfection.

You hear a lot of talk about those veterans who are handicapped, and rightly so, and for whom special placement programs should be established. You know a man is not handicapped except on the job in which the handicapped member is important. A clerk sitting at a desk does not need legs, and a man can work even if he has only one arm or one eye. Those with bad hearts or an arrested case of TB you try to place because they are handicapped. If you are not perfect, I might suggest that you ought to begin thinking about the fact that all of us are handicapped.

Everybody is handicapped mentally or physically or temperamentally or educationally or culturally or in certain skills or abilities or aptitudes. We are all handicapped, not in such obvious ways as the veteran who has lost a limb fighting for us. But we are handicapped, and if we say that no veteran who is handicapped can do good work on a job which requires the use of the member which he has lost or which has been crippled, then you and I, when we are placed on jobs where our handicaps are needed, are also going to do pretty poor jobs. We are all handicapped.

Let's examine some of the things that we might consider and dream about when we day dream on handicaps. You know and I know that no one of us can do a job unless we are paying attention to what is taught. You know we cannot learn anything unless we are paying attention to what is taught. Attention is the primary and basic foundation for all mental activity.

The psychologist for many years has talked about what he calls "attention span" or immediate memory. It is a different kind of memory than you normally think of. What you *usually think of as memory is* what happens when you experience something today and maybe remember it six months from now or ten years from now.

As I walked in the door a man walked by and I said, "Wait a minute." He turned around and spoke to me. I had not seen him for ten years. Some of you remember Mr. Cameron for his work at the Council. I remembered him. That was memory. I recognized his face and that delayed memory is the kind we usually think of when we think of memory.

Another kind of memory is immediate memory or attention span. It is the kind you use when you look in the telephone directory and get a number and by the time you put the book down and get the operator you have lost the number or you twist a couple of the numbers, which means you did not get it right in the first place and if you don't get it right in the first place you never will have it right.

*Let's try an experiment in attention span.* I'll read some numbers to you, and I want you to put them down on a piece of paper. I am going to start out with three numbers and wind up with ten numbers.

This is a standard psychological experiment. You are not to put these numbers down as I read them to you. You are to put them down in a series after I read them to you.



For example, I say say—2, 4, and 6. Don't write them as I read them to you but wait until I read them and after I have said "6" then write them down. I will start *out with three numbers* and go to four, and then five and wait until I complete the series.

Here is the first of them. The first series is 3, 6, and 4.

Are you ready? The next is 2, 9, 8, 1.

The next—5, 8, 4, 6, 9.

3, 1, 7, 5, 8, 4.

Ready—attention 3, 6, 4, 1, 7, 9, 2.

If you don't have it now you will never get it. That is why it is called immediate memory.

Ready—6, 2, 3, 9, 4, 8, 7, 9.

All right, we will have just two more. Here they are. Listen carefully. 5, 8, 3, 7, 2, 1, 8, 6, 3.

All right, here is the last one. Attention! 4, 7, 2, 6, 1, 9, 7, 5, 2, 8.

If you were sending someone a bill for $4,726,000 or $197, or $47 million, and you made it $43 million or $437 million, and twisted a couple of numbers around, your bill would be wrong. So in that case you either get the entire series right or you get the entire series wrong.

I am going to read them back to you and I want you to check them off to the largest series you got correct. The first one is 3, 6, 4. The next one is 2, 9, 8, 1. The next —5, 8, 4, 6, 9. At this point I would like you to raise your hands. How many of you got them all right *so far.* Practically everybody.

Let's see what happens when we get to the six and seven number series. The next one is 3, 1, 7, 5, 8, 4. How many got that one all right? Practically the same number.

Now, this is the breaking point. 3, 6, 4, 1, 7, 9, 2. How many got that right? Almost as many but not quite.

The next is 6, 2, 3, 9, 4, 8, 7, 9. How many got that right? What has happened to you? We don't have as many as we did. Let's go on. The next one is 5, 8, 3, 7, 2, 1, 8, 6, 3. How many got that one? You are disappearing from the scene.

The last one is 4, 7, 2, 6, 1, 9, 7, 5, 2, 8. How many got that one? Just a dozen altogether out of a couple of thousand people.

If the process of selection of workers is not a selection process but an elimination process we have done a job of eliminating some of you from a job of some kind, a job which requires the attention for work such as in billing or checking or handling certain kinds of figures. We have eliminated you as potential applicants for that kind of a job, haven't we?

Advertising people learned many, many years ago that the average span of attention is about six, and they learned that those long slogans that we used to have and the great big ads that people had to read and remember just didn't stick. They don't get them. If you are trying to teach a man who doesn't have the capacity for retaining beyond a certain amount, he is not going to get it regardless of how good a teacher you are, or of how interesting the material is.

I would like to have you raise your hands again. How many of you, let us say, got six right and then seven wrong and then eight right, or seven right and eight wrong and nine right in which you got a lower one and then a higher one and in between you missed? How many of you did that?

Sure, a number of you did. We call you fellows the slippers. We are not always too sure of your paying *complete* attention. Maybe while you have your mind on what you are supposed to be attending to, you are also paying attention to some other things that are a little bit more important or a little bit more distracting. Your worker, if he is human, has the very same problem of *vacillatory attention.* You and I know it only takes a very short moment of inattention at the right time to do the wrong thing or do something that will spoil the work and have an accident.

We have experimented this morning with the very simplest test of auditory attention span. But then there is visual attention and there is the factual attention span. There are various kinds and combinations of audio-visual attention span and so on. You might, if you want to, play around with them. You might experiment and discover whether some of these so-called dumb workers are *really dumb. They may not* be so dumb, but their attention span is shorter. They may be more distractable.

What are you paying attention to now? Maybe you are paying attention to me, but

*you are also paying attention to your* neighbor who may be sitting too close or smoking a cigar or the fellow in front of you may have a bald head and the light is reflecting down into your eyes. You are paying attention to things all around you, and these things distract your attention and keep you from attending to what you want to attend. Emotions distract your attention —so do worries, personal problems and troubles, things that make you angry, things that bore you.

When you are tired or unsure of yourself you are thinking not of what you are supposed to be doing, but rather you are wondering whether you can do it. Your mind is on things that are important to you. When you go out into the shop as a maintenance man and have to climb up that ladder to reach something your mind may be on another problem. It may seem silly to others that you are frightened by height when you climb up six feet off of the ground, but you don't tell anyone. You don't tell anybody about that because you know that it sounds silly, and they may make fun of you. But nevertheless, that is on your mind even though it is not in your job description.

*Inattention may be caused by aches and* pains or by being overconfident or not liking the boss. Those things are things that distract your attention. They are simple, everyday things and those are the things that *distract you. Because of man's inability to* pay attention to more than one thing at one time and because of man's inability to pay attention to one thing for any great length of time, you are demanding too much when *you expect people to pay attention to what* they are doing all of the time. Maybe you are expecting too much when you are expecting people to be safe all of the time.

You cannot do much about these individual problems, can you? The natural makeup of the person is like that. But you can do something about selecting, placing, training and counselling people. If we can select salesmen, clerks, supervisors and machinists who fit the job. Different jobs require different things and different people have different weaknesses and strengths and different kinds of attributes. If we jibe the two, we will discover where to place them and how to place them and how to select them in the first place.

Every time I make a talk, there are always a few people that come up and ask if I would recommend some books. There are those people who stop me as I walk in the door and ask if I can recommend some reading. Last year I recommended an article on music in safety. I wrote to the American Psychological Association and asked whether they had requests from industrial people for copies of that publication. They apparently do not break down their customers, so I don't know how many of you sent requests.

Let's see what articles we have on selection. There is an article in the Journal of Applied Psychology on improving the selection of linotype trainees. Maybe you are not interested in linotype operators, but let's see whether or not you are interested in any one of these other titles:

"Per Cent Increase in Output of Selected Personnel As an Index of Test Efficiency." You will also find an article entitled the "Selection of Biological Pharmaceutical Checkers."

"Predicting Success in Machine Bookkeeping" shows that in October, 1937, average production was 105. In December, 1941, it was 110 and then went up to 116 in 1946. Here are the figures on the increase in average production of bookkeepers based on selection—and that is from the Pennsylvania Company in Philadelphia.

We have a whole monograph on the subject of *work adjustment in relation to family* background. One of the men attending a Safety Council advanced course told me that if his company had known something about a worker's family background in several *specific cases, it would never have hired* the man in the first place. They would have known in advance that he obviously was part of a whole picture which would prove a source of accidents.

This monograph goes on to say that the interviewer can adopt rules for screening at the hiring level. A study of a job contains data which might be used for transferring accounts and figuring out where each will probably do his best work and so on.

Here is another one: "Learning in Accident Reduction." And we have "Analysis of Personnel Data in Relation to Turnover on Factory Job" and "Labor Turnover and Its Correlates," "Test Scores and Efficiency Ratings of Machinists" and "Selection of Assistant Managers."

"How Better Personnel Selection Can Reduce Factory Costs" is a study showing that with an increased cost of about $6,200 a year or $8,700 for the first year of operation, a program would save $12,000 in its first year.

I don't know whether these things mean anything to you. It is waiting for you to go out and get it. Nobody charges for it. None of these men who write in these journals of psychology get paid. They are sending them in as contributions for you. Maybe you are not interested in linotype operators, but is there any essential difference in what a linotype operator does from what a typist and others do? There are articles on nursing and bookkeeping. You have a vast amount of literature if you would only go for it. The elimination of those who are potentially accident producers should be of interest to you.

One thing that we should all be concerned about, of course, is the matter of psychological problems that arise among workers. Let us first talk about "normal." Although we have our own peculiarities, nevertheless, we are normal.

There are various definitions for "abnormal." It is a statistical thing which fits you into a curve somewhere. Nobody is normal or abnormal except by comparison with his neighbors and in society. On the other hand, there is such a thing as a personal normalcy. When you say, "I wonder what is the matter with him; he is not like himself" then you are saying that man is not normal for himself. An individual is more *liable to have an accident when he does not* perform as he should, and he does not perform as he should when he is not himself.

Can we make psychiatrists of supervisors? No, we do not want to do that any more than we want to make doctors of our nurses. But in the same way that your nurse has been trained to deal with minor injuries and minor ailments and is capable of making diagnosis and providing care for minor ailments and minor disturbances, so your foreman can be taught to recognize minor psychological disturbances and what to do about minor psychological disturbances. He does not have to be a psychiatrist.



If he can recognize that this man is one *that he can handle, while this one needs to* be dealt with by someone better qualified then he has been trained properly. Whom can he learn to recognize? He can recognize the high powered boy, the tough guy, the six-foot-two, 220 pound fellow who does not bruise easily and knows he is not going to get hurt. He can pick up heavy loads and handle 110 volts and never get hurt. He does not want to fool around with this safety stuff because he says he never gets hurt—and the funny part of it is he doesn't! But he sets a bad example for somebody else.

Then you have the dynamo, overactive, *high tension type who talks too much and* goes at high gear and shows off and disregards details because his mind is on "important big things." He is not interested in details. He ignores safety rules and safety guards and takes a chance just to see what will happen. You do not have to be a psychiatrist or psychologist to recognize him.

Then we can recognize the little "Blue Boy." He is the fellow whose world is just sad. It is just a tough place. Life is just terrible. He is sad and depressed, and everything is going wrong. He needs some help, too.

Then you have the fellow who is suspicious of everybody. He doesn't pay attention to what he is doing. His mind is on such things as, "Is the boss around?" If anything goes wrong, he knows it is not his fault; he knows somebody did it to him. The boss has it in for him and always gives him the worst equipment, the worst tools and the worst jobs.

Then you have the great majority of troublesome workers, I refer to the "I want to be babied type". These people are always sorry for themselves. They are always having a lot of little emotional bumps and bruises and always want to "go to papa" so he will kiss it and make it better. You can recognize them. Those people are what I call the real accident prone, because they are always emotionally distracted from their jobs.

If there is such a thing as an accident-prone person, it is this group. They represent 28 per cent of your staff, of your working group. This group is emotionally tied up with other things so they are likely to get themselves into difficulties.

These things are the inner signs of some troubles and some conflicts and difficulties that need to be dealt with and either the foreman recognizes them, knows he can deal with them and actually goes to work on them or he should be taught to recognize them and insist, as he does with a minor scratch, to go down and have it taken care of. We do not ignore a minor scratch. We must not ignore even minor emotional problems.

To continue with our day dreaming, let's see whether there is not something else that we might consider. As you look around in industry, isn't it true that what we are striving for *constantly is simplification?* We are constantly trying to simplify things. Let's mechanize them and make them repetitive and routine so there is not any waste. That is efficiency!

On the other hand, I sit around and study it and say, "What is similar between this and other psychological experiences?"

When we get people in the laboratory or clinic and make certain experiments, we sometimes get funny results. While I was at Fargo talking to Dr. Burgess about his experiments on hypnosis and hypno-therapy, it occurred to me that in order to get a person under hypnosis, we set up a routine and repeat a stimulus, maybe an auditory one, over and over. This quiet repetition of the same stimulus finally puts the individual to sleep, and we can do whatever psychological experiments we want to carry on.

When we have simplified our jobs to the place where we are doing the same thing over and over, and over and over for eight hours, it is possible that what we have set up is a hypnotic situation where we are mentally put to sleep so we cannot and are not aware of the conditions around us?

Is that the kind of thing we have done with our *simplification?* Wouldn't it be better if, from time to time, we would inject something that would break that over and over and over-ness?

Think about that! I am sure that hypnosis has nothing to do with strong will or weak will of the hypnotist. Anybody can do the experiment of hypnosis if he knows the elementary steps. Isn't it possible that this analogous situation might be a true one? Isn't it true that what this over-simplification is doing is setting up a situation in which our people are mentally and *psychologically* asleep and unaware and therefore, perhaps, accident prone as a result of that kind of a situation?

Last year on a train to Wisconsin I ran into a fellow by the name of Phil Smith who was a U-E organizer. He was going to Wausau for a meeting, and he said, "You know this stuff you are doing is very important—teaching about safety." I asked him why if he felt that way he had called a meeting when we were having a meeting of the same kind, and he said, "Our people are different. You will discover that. If you have five fingers you are still an apprentice and the fellows kid you. You are not even out of the apprentice class until you have lost a finger." That was a sign symbol and badge of skill—having lost a finger.

He said that I would meet a lot of fellows, and when I shook hands with them I would find that they have only four fingers. These men expected to lose fingers and they accept the loss as unavoidable.

I said, "Wait a minute! That reminds me. When was the last time you safety engineers came to work knowing full well that today there was not going to be an accident? Isn't it your psychological attitude—coming to work knowing that you just cannot *not* have an accident?"

You believe there must be an accident. You don't know where it is going to happen, but you know you are going to have one. Subconsciously there must be an accident. How can you run a business without one? Isn't that your thinking? Sure!

If the miners go down there without hard hats, shoes or goggles and if the machine workers feel that they have to lose fingers or else they are not even started, and the engineers say that they have to have accidents—*why?* Why do you have to expect them? I don't know why. That is not the way the machine was built. Maybe you have fallen down on your job of teaching your people how to do their jobs. Or maybe you feel that, "We ought to have a little bit of an accident rate or else people will forget."

I heard just that point expressed in West Virginia last year when I was in Charleston. "You cannot reduce your accident rate way down or pretty soon something serious will happen or they will be thinking that they are not going to have accidents and will get overly sure of themselves. So we have to have a few accidents." I don't want to be on the receiving end of that kind of management or supervisory thinking.

We have about two minutes left, and I want to ask you to do some more day dreaming. Isn't it strange—I gave a talk here last spring before an industrial group, and I will tell you later who it was. I don't want to spoil this. In the middle of my talk I said something in answer to a question and you could just hear the audience rise up and murmur. I could not believe that what they said was true. So I decided to find out. I did.

Is there any one place in your organization or in your plant to which every person who falls sick and to which every person who has an accident must go? Sure there is—first aid or to the hospital. Sure, we have a place. All right, who takes care of 90 per cent of all of these people who are sick or who have accidents? Who takes care of them and collects all of your basic accident data for your records and reports? It is your nurse, isn't it? Who is on your accident or your safety committee? Your superintendent, maybe your doctor, maybe your personnel man, and maybe you can get somebody from the union.

The group I spoke to was the Industrial Nursing Division of the American Nursing Association. One of them got up and said, "What can we do to sell the safety directors on the fact that we could contribute something to the program?" Everybody in the room applauded. It was a universal problem, and I still cannot believe it because it is not possible that the one person who deals with 90% of your disabilities, the one person to whom they come, the one person who keeps all of the records and information and gets the basic data for them should not be on your safety committee. And furthermore, from the time we begin to think of going to work and make a living we are brought up to suspect our supervisors, suspect our executives, suspect our managers and suspect our bosses. We have that kind of allergy with authority, don't we.

But there are the people whom we always suspect and the people in whom we always have confidence and in whom we always have faith. We always trust our doctor, and we always trust our nurse. If you would go down to that first aid room where that nurse is, you would find that she is not only treating fingers when a lot of them come in with fingers and want to get them fixed. They want to get things off of their chests and talk to her. I would say that the one person who should be on the safety committee with you should certainly be that nurse because she is the one who lives with 90 per cent of these people and she has a strong relationship with those who have accidents and emotional stress.

Perhaps the last time you went down to see the nurse you did more than just take a couple of aspirins. The chances are that you talked about something that was bothering you. She *is* the one that can do a perfect job for you. I recommend her to your committee.



## Some Thoughts for the Future

Yesterday we did a bit of day dreaming, and I wonder if we might not spend the next few minutes profitably by doing a little more day dreaming. I doubt that any of us have ever gone to a doctor complaining of something wrong without talking about other things—things that are on our chests, things that are on our minds, things that bother us.

When we talk about the family doctor, we are *talking about someone more than* just a medical man. We are talking about someone in whom we have confidence and to whom we tell our troubles. Maybe we can learn something from the Western Electric program and from the counselling programs of other companies. Couldn't we have one of these high tension, high powered interviewing and counselling programs, where the foreman, who lives with the worker eight hours a day, is taught enough about non-directive counselling so that he, too, *can* deal with minor maladjustments, every day on the job?

I think it would be a fine thing if these people were taught a *little bit*. I just wonder whether we would not be far better supervisors and the men be far happier men on the job if we did that.

Why must we wait until fellows or girls come to our plant for a job before they are formally introduced to the problem of industrial safety? Eighty-five per cent of the boys and girls who graduate from high school do not go to college, but they go into plants, shops, and offices. Is there any reason why this raw material, beginning back in grade school, could not get as part of an industrial civics a thorough grounding in safety? They should know something about industrial safety as 85 per cent will be concerned with it when they get out of high school. The most important time for people to learn is in the earlier years—before *they ever get to industry.*

If you study accidents you discover that certain kinds of accidents seem to occur around certain kinds of equipment and are related to certain kinds of jobs. Is it possible for us to develop a program or a plan similar to the scientific job analysis so that instead of job analysis in terms of production we think in terms of *job accident analysis, too?*

We might reorganize the pattern of performance or motion paths in a job so as to eliminate those specific situations in which accidents usually occur. In traffic safety you think of spot maps so you know where accidents occur. Could we have a job spot map? Could we have a job analysis on a chart ... that we could spot accidents that have been occurring at a certain location?

It may be that at this point we could eliminate or reorganize steps in a job. Job accident analysis, not statistics which merely hide things is needed in your programs. Statistics tell you quantity but they don't place the accident at a given spot.

In this day dreaming we might say, "We have been taught that speed is a very important factor in the production of accidents. Speed on the production line somehow is related to accidents." Then I. day dream some more and say, "Since an accident costs anywhere from fifty cents to several thousand dollars with the average accident costing *about fifty dollars*, how much slower can a worker work and still not increase the overall total cost of production which includes accident costs? Could we reduce our speed by 5 per cent and maybe in this manner, reduce the number of accidents that occur? If we add the amount of money saved, would we discover that our total cost of unit production or overall production has not been increased?"

We have certainly considered that a number of people who are more likely to have accidents could be eliminated from the organization by tests. Is it possible that the Safety Council could set up an industrial cooperative research program in psychological test development as related specifically to the elimination of those that are more likely to have accidents?

Instead of each of you doing a little research work, wouldn't it be better to have the centralized organization which you have now and which is functioning as your center of information doing it?

When a man works for you and is paid a fair wage, you could well expect him to put forth his best effort. If he does—and most workmen are honest workmen—why is it that an incentive plan will cause him to exert sufficiently more effort to produce 15 to 25 or more per cent than he did before? Apparently there is an added incentive and I again say, "How can we develop a safety or accident reduction incentive plan which will return to the workers in terms of departmental bonuses or even individual bonuses some of the money saved as a result of maintaining an accident record way below established goals?"

Why is it that when someone steals a quarter we say he is a thief. When he attacks me so that he might steal something (even though he runs off before he gets anything), we still think of him as antisocial. Why cannot we develop some kind of advertising promotion sales program in our industrial society which will spread the thought that you who disobey safety rules are a felon.

You are an anti-social person within our industrial society, and as such I do not want to have anything to do with you. You are anti-social, and you should be eliminated because in your disobedience of rules you are not only a menace to yourself but you might hurt me. Therefore, you are anti-social.



Let's go on with our day dreaming. First, I would like to point out to all of you that you are working in the field of business, and it might be a good idea for you to find out what business is. A business is an activity which has as its sole purpose the earning of profit for its owners, the stockholders—that is all a business is.

A business is never established by its owners for the betterment of society, the economic welfare of a community, to provide incomes for the workers or to achieve any of the other many tangible and intangible values which often result from the establishment, existence and operation of a business. These by-products are secondary and are incidental to the one purpose for the establishment of a business, that is, to provide a service or to sell a product which will make profit for the owners or stockholders.

Since profit is the sole basis for the establishment and operation of a business enterprise, every idea, every plan and every program must be critically examined prior to introduction and use. We must measure its value, its rightness or wrongness, its goodness or its badness by that one gauge—will it or will it not directly or indirectly result in or contribute to the profit for the owners of this business?

This definition of business and its everyday activities include practices described by such words as "ethics, honesty and integrity." Otherwise, instead of using the term "business," we might use the terms "racket, confidence game, swindle, or fraud."

An honest business that is honestly and properly operated has only one criterion of good—that which helps in creation, production and enlargement of profit for its owners is good and that which does not is not good.

Persons who do not analyze too deeply are often misled by those who have beautiful dreams of a world in which business is operated solely for the benefit of the people who produce the goods—the so-called worker. The dream is a very beautiful one, just like all dreams can be, but it does not take into account that the end product of any business is the result of a vast amount of planning, thinking, creating and organizing and that this, too, is work. Planners, thinkers, organizers and investors are also workers.

Perhaps in some theoretical state of nature all things might possibly belong equally to all people, all work might be of equal value and all workers of equal importance. Such a world would require a completely new set of political, economic, social and psychological values than those now accepted, believed in and lived by. But although dreamers are one of our most vital assets, dreamers never create anything but dreams and ideas. It is not yet possible to live by dreams alone. It is not yet possible to live by production alone.

Those who have the capacity for converting dreams to useful products are the key industrial, economic and social leaders. In business it is usual to have teams of "idea men," converters of ideas, and producers working together, because few, if any, of any group of men have the capacity of functioning in all three areas.

There is no evidence that the world would be a better world; that men and women would be happier, healthier, less insecure, less avaricious, more community minded in a society not capitalistic. All we have are the well organized and highly intriguing dissertations and dogmatic assurances of some "do-gooders" upon which to base a social revolution that is supposed to bring Utopia to everybody. It is rarely taken into account that not everybody would be willing to cooperate as well as participate in that Utopian world. It does not take into account that some workers will be workers while others will be shirkers.

It does not take into account human failings and weaknesses. Perfection of a system, in fact, perfection of anything in human life will never be attained but can only be aspired to. And there is nothing to warrant the conclusion that some non-capitalistic system would be a better one. I do not know of any man who works or would work without the incentive of money. I do not see any reason why any man should go into business without the incentive of money.

The workman at the bench converts his abilities and aptitudes and skills to money. Money is his only incentive for hard work. The same basic purpose should be permitted everyone else whether or not he be-

longs to a union. I have been warned by far wiser people that if I ever try to change people's ways of living or doing or thinking I am sure to get into trouble. I am sure to be called a radical, a disturber of the peace, a nuisance, and so on, but despite my years I am still young enough to find myself urged on by two of the world's greatest lessons for good in the history of man.

Those of you who are Christians may view him differently. Since I am not a Christian, I can look upon Christ as a protest—a protest against an evil social, political and economic past. I can view America itself, our way of life, our dreams and our aspirations for the achievement of personal happiness for the individual as protests against an economic and political and social past. I believe that we are pretty well ready for another protest, a protest against an industrial past, a past of which we can be well ashamed, a past built on intrigue and avarice, greed, and materialism as is still represented by some of the stupid and archaic members of the National Association of Manufacturers, the left wing of the CIO, and the right wing of the AFL, as well as the racketeers of both labor and management that do not represent all that is good in management or labor, but who make such a hell of a lot of noise that people think they speak with authority.

I even question their honesty of purpose because I think they live along the Hitlerian lines that if you lie big enough and often enough people are sure to believe it.

We in America are the kind who always are thinking about tomorrow. But sometimes our optimism is stretched to the breaking point. We have seen honest management leaders, united by vicious organizers, wage a successful and unsuccessful war against labor. They have established war with labor as a permanent, necessary and abiding principle of industrial life. We have seen honest workers organized, united and misled by vicious labor leaders into a common army of permanent war and continuing attack against management.

I believe that most industrial leaders and management men are honest men, and I believe that most workers are honest men and women. I further believe that honest men and women can be united for a common purpose of industrial peace and mutual welfare more easily than for industrial war and mutual destruction, if somebody would only try to do it. But nobody has ever done it!

I believe that the virtues of industrial peace have more selling features than industrial war. But I also believe that we have been so propagandized from time immemorial that we have bought the shoddy substitute which industrial and labor "con men" have imbued with values for us.

Sometimes, in my more skeptical moments, I think the world may be going to the dogs. But this mad world has been going for so long that I doubt that it will ever get there. Maybe we should ask, "What is this world coming to?" But in America I think our madness consists of a protest against an old world with which we are still shackled, a European world. I think our protests are a demand for a new life in a world which is sick and tired of living with sophistry and those living dead who from generation to generation have forced on us ancient and antiquated concepts of human relations, whose only virtues are their antiquity and which regularly lead to and are leading to war and murder and destruction and killing.

We say, "Down with foreign ideologies." But let's examine our own ideology. Isn't our present management and labor conflict completely built around a European import of hatred of worker for the employer? Isn't that Marxianism?

How about cleaning house and building our own American economy? We have always been in every way more alive, more vital and more intelligent industrially and socially than Europe. Why continue to live in America strangled by European worker-employer philosophy?

Our American protest is against the economic philosophy of the European way of life which accepts one man as a master and another as his slave as basic to divine planning. We believe the individual more important than the state politically. Let's begin to think so industrially.

Once we conceive of our industrial relations not as economic relations or as labor relations or as legal relations, but as human relations, then we will have carved out our path toward an American way of industrial life. We cannot expect people who have achieved their way of life by rebellion against self-established masters and rulers, as we have, to accept with quiet resignation self-established masters in industry.



The infant in its mothers arms will gurgle and it is happy. But when you put it up against your shoulder and, in order to protect it, you hold it tightly, the child begins to kick and yell and scream.

The mother says, "You must have frightened him." You didn't at all. What you did was to put your arm around his body and bind his arms and body and legs. You were physically binding him and bindings of any kind result in wanting to break those bindings, psychological as well as physical.

We will try to tear down any of these things which are established to control us by others. Maybe it is a good thing because I think we will all agree that self-control is far better control than imposed control. That is our American human nature. Maybe you don't like our American human nature and maybe you believe a fellow ought to do whatever his boss tells him to do. Maybe the American workmen will do it, but he will not accept as gospel whatever comes out of the mouth of the boss merely because the boss said it. The human nature of the American is that he thinks he is as good as any man, even the management man. He may do what the boss tells him to do but he does not have to like it.

He demands the right to express his dislikes and if he feels that he is being taken advantage of he feels too that he doesn't have to "take it."

The American is not convinced of the divine rights of management or bosses and his human nature is such that he will do many things for money. His human nature is such that he will do more things for a person and his human nature is such that he will fight and die for a principle.

One great principle is that of democracy and every man in democracy wants to feel that he has had a hand in the thinking and developing of those things which are going to control him, those rules and principles and policies by which his life is going to be limited and guided and controlled.

Every man wants to know that he is part of the community in which he lives and is accepted as a psychological if not economic equal to every other citizen in the industrial society in which he lives. Every man has pride—pride in his accomplishment. He resents the continued lack of interest of management in providing him with the training, background and information necessary so that he will be a better worker which will take him out of the mediocre, in which he sometimes mentally finds himself.

Every man resents consciously quite often and subconsciously all the time the term "management man." He says, "I, too, am a management man. I am working for management. Who am I working for if not management?" He says that the term management man is a deliberate creation of management to maintain him as a peculiar and different creature.

Up here at the top of the organization we have the president, the superintendent, and down here is the foreman. They are management men. They are one kind of creature. Down here we have a different breed of creature, a sort of a sub-human species, called the worker, and management has set up that line of demarkation.

It is management that has devised the term "management man." You are never going to make me a part of your organization if you say that the people who produce the stuff are not with us but are alien and peculiar and foreign for the term "management man" implies that there is some other kind of man.

Your job is one of living and working with people. Your men will always be human and their human nature will never be changed. That means you have got to learn to work with it. Maybe you can learn something about their human nature by examining your own.

The other day we talked about the concept of whether you are perfect. Of course, you would say that you are not perfect. Don't you hate perfect people? Don't you hate "know-it-alls"? Don't you hate people who seem to always have a ready answer sometimes even before the question arises,

and they are sure they are right all the time?

Don't you dislike that kind of person? Don't you avoid them? Sure—you stay away from them and look down on them. Everybody dislikes the person who never makes a mistake.

Why don't you hang a banner somewhere in your office or carry a badge which says, "Look, I am normal, too. I make mistakes. I am not always right. I don't know all the answers. I want help and ideas, and I want it from anybody who has ideas." Or are you afraid to admit to the worker that perhaps the supervisor is not perfect?

One of the conditions that arouses rage and resentment is pressure—pressure to do something which is beyond the capacity that you think you have. Do you assume in your work assignments complete capability on the part of the worker to fulfill the assignment? Do you overlook the fact that even as you and I are handicapped every man is handicapped, and that you may therefore expect poor production, poor cooperation, poor effort, resentment, anger and rage contained perhaps on the part of the worker who is forced to work on things which are beyond his capacity? You don't expect him to say to you, "You know I am too dumb or I am too weak or I am slightly nuts and I cannot handle that kind of thing." No, you are the one who must discover it.

Did you ever have the experience of someone coming to you and saying, "Look, I am in a jam; I need some help. I don't know the answer." Did you ever have that experience and then turn around to that man and slap him across the face and say, "Scram, bum." I don't think so. I think what happens when somebody comes to you and says, "I am way down here by comparison with you who are up here. I know little and I am coming to you because you are superior to me." We are psychologically flattered. Our mental chest sticks out; our heads may be expanded slightly. We like that fellow and we are flattered and we say, "I don't know whether I can help, but I surely will be glad to help you if I can." You like that fellow who built you up psychologically by coming to you and saying, "You are a better man than I am."

Why don't you go out of your way, even if you know the answers, to create a series of problems so that you could go to people from day to day and say, "Bill, I am in a jam here. I wonder if you could help me out on this thing." Why don't you use it?

This one is an old one, too. If, after this meeting one of you should come up and say, "Dr. Rosenstein, these talks are wonderful; you are the most wonderful speaker. Where have you been all my life." I might modestly lower my eyes and say, "Thank you so much. It is kind of you to say it." But I might be saying to myself, "I wonder what this cookie is after."

I might be suspicious of flattery when it is laid on thick with a trowel, right to my face. But if I were to come down to the Safety Council next week and one of the fellows would say, "Gee, Doc, you surely did a swell job. We got eight or ten letters. Look—here are letters of appreciation." I would look over the letters, and I would turn to the fellow at the Council who gave me this information and say, "Thanks, a lot," and I would think he was a pretty swell guy and at the same time I would not be suspicious of the motives of those letters. I am never suspicious of indirect praise.

If you go down on the shop floor a quarter of a mile away and say to one of the fellows, "Joe is really going to be one of our best men." Then if you walk straight to Joe you will find that by the time you get there, he has already heard it. I don't know how the grapevine works, but it gets there! But indirect praise is the best—use it all the time, every day.

We are all human, I think. And not being perfect, we have weaknesses of varying kinds and varying degrees. We are not proud of our weaknesses, so we cover up for them. If we are not too sure of ourselves, we do one of two things. We shy away, are timid and stay away from things in which we might get involved. On the other hand we may be over-aggressive and arrogant. You feel sorry for the fellow who is shy and timid and withdrawing and you want to help him. But you want to knock this other fellow's ears down. Why?

The fact is that both the over-aggressive, arrogant individual and the very shy, timid one represent two facets of exactly the same thing. They are both telling you, "I am not sure of myself. I have a strong sense of inferiority. I need building up. I don't need my ears knocked down. I need building up."

You may not see it so obviously in this overly aggressive, arrogant person, but you do see it in the timid person. If the timid one were sure of himself, he would not be timid, and if the arrogant fellow had confidence in himself he would not have to fight and knock everything else out of his way.



## Some Thoughts for Yourself

In our first three morning meetings we considered and thought about problems of human relations in terms of your relations or the supervisor's relations with others.

Eight hours a day you are working in a situation which is really a social situation. You are living with others, and this morning I would like to think with you, not in terms of your life with others, but rather in terms of living with yourself. I want to talk about the things that are considered when people talk about personal happiness, personal adjustment, peace of mind and a host of other things in the same general category. We rarely live with any person more than eight hours a day, but we live with ourselves 24 hours a day, and sometimes our major problem is with ourselves.

A psychologist is in a rather bad position to discuss with you in a positive way this business of peace of mind, because he rarely sees those fortunate people who do have peace of mind, who are contented, who are happy and who are adjusted. The people he sees are usually the ones who come to him and beg for help. They are frustrated, disturbed, and distressed and want someone to take them by the hand and lead them through those dark and terrifying emotional woods into which they have strayed.

Maybe we can learn from these people who have become disturbed, if we can discover how they went about losing this peace of mind. From this we may learn something for ourselves.

So these are the words of wisdom that I bring to you this morning and I speak in all modesty when I say "words of wisdom" because I still believe, as I always have, in the old aphorism that if you take the ideas of one man it is plagiarism. But if you take the ideas of many it is research and I have done a great deal of research in gathering my story about peace of mind to you. So I am not going to be profound, I am not going to bring you any great new philosophy of life. I am just going to try to tell you in as simple fashion as I can what I have learned from this research.

It seems to me that peace of mind is completely and solely dependent upon an inter-functioning triad of a simple faith, a simple bit of knowledge, and a simple body of action; an inter-functioning trio of believing, of knowing and of doing. The last, of course, is most difficult—getting people to do things, even for themselves.

Last year we learned that psychology was that branch of study which attempted to discover what people did and why they did things, not because we were interested in human nature or understanding human nature, but rather because we were interested in trying to discover some principles or some rules or some laws which were fundamental and which we could use in order to guide and direct and control this human nature so it would do what we wanted it to do when we wanted it to do it.

But when we talk about the control of human nature we rarely find ourselves thinking in the first person. It is always the control of someone else's human nature. It is rarely our own. We discover, too, that our logic is peculiar and twisted when it relates and considers human nature.

We are pretty intelligent and fairly reasonable in dealing with things, but not so reasonable in dealing with people. When we deal with things, we know we must deal with them according to the qualities and properties which are inherent in them. But when it comes to people, it is different.

For example, we still have these old examples that are good. If I were to come to you again and say, "Here is this won-

derful fabulous gem known as the Hope Diamond. If you will take this Hope Diamond anywhere—home, down to the basement workshop, and split it exactly in half, I will give you half of it for your own," you might say to me that it was a wonderful opportunity but that you did not know anything about gemology and you did not know anything about the crystal or the structure of the valuable stones, nor the principles of cleavage. If you did not handle the Hope Diamond according to its own qualities and properties and limitations, it might blow up in your face and all you would have would be some diamond dust.

If I were to come to you and say, "Here are a couple of chemicals. I want you to take them in the other room and close the door tight and throw them together and see what happens. You would perhaps say, "Wait a minute! What are these things?"

I would say that I did not know and I was asking you to find out. You would probably say, "You may be the boss, but if I don't know the qualities and properties, the physical and chemical properties of these things, I might find myself blown out of the window or through the wall. I have to work with these things according to their qualities and properties. I do not think that, just because I want them to mix together *smoothly* and *quietly*, they will necessarily do so. They will function according to their own qualities and properties and limitations."

If I tell you that I want you to go out and buy a machine and you would say, "What kind of a machine? Any old kind of machine?" When we buy good machinery, we buy only because it is something we want to use. We think in terms of specifications, because these specifications describe the qualities and properties and limitations which are going to be built into that machine.

When we deal with things in our logic, we say that if these things function according to their qualities and properties, certain things will happen, and if they do not happen as with a machine we immediately say, "I wonder what happened; I wonder how that happened." So we see what really did happen if we can and find out whether we can correct it.

But when it comes to people and human nature, if it does not funtion the way we want it to function, we do not say, "Let's check this man and find out what happened and how to handle this human being." We say that he is perverse or he is vicious or that he refuses to cooperate. But he, too, has his qualities and limitations and properties. So when it comes to human nature, we say that that is different. Then we say, "I am going to do as I please, if I want to I am going to ignore every law of human nature and I would like to see somebody stop me. I'm a free American." Then we wonder why so many of us who break these laws of human nature wind up disturbed and distressed and why more than 50 per cent of those men and women complaining of physical aches and pains do not have a thing wrong with them physically.

When you think of peace of mind, do you think of it as a sort of condition, a state, a sort of Utopia filled with quiet rapture?

I am sure that most of you read or bought the book called "Peace of Mind." You must have bought it for a reason. There must have been something you were thinking of and groping for. When you think of peace of mind, do you think of a paradise of ecstatic tranquility? When you think of peace of mind, do you think of it as a sort of condition, a state of Utopia filled with quiet rapture? Is that what you think of when you think of peace of mind?

When you pray for peace of mind do you pray for a life completely free from insecurity? Do you pray for a life free from strain and pressure and emotional distress? If you do, you just want to be dead, and you might as well go home right now and crawl in bed and pull the sheet over you and die, because you are not looking for life. You are looking for some kind of drugged world, a fantastic non-existence, because the only things that have no fears and the only things that have no worries and the only things that have no pain and no strain and no suffering and no insecurities and no tragedies and no losses are dead and inanimate.

Maybe you ought to decide first whether you really want peace of mind because it does not spring like Topsy, full grown, out of nowhere. It is something that has to be built, and it is something that has to be planned for and worked for and nurtured every single day. Because it is a delicate and fragile thing of beauty, of placidity of spirit which lives in the imperturbable soil of knowledge that life is real, and life is earnest and life is cruel and barbarically sadistic—and yet so astonishingly beautiful.



I turn to Freud for my research, and many things Freud taught us are not liked by a lot of Americans. The fact is that Freud has never really been taught in this country. His German was mistranslated by some early eager beavers, so it was many years before we discovered what he really said. One thing he did teach us, however, that is worth remembering was that everything has a history and everything in a human life has a life story of its own. Just as you personally are the end product of your personal biography, so peace of mind has a life story, and peace of mind can be created by building a life story for it in your own personal life through a simple faith, a simple body of knowledge and a simple body of action.

Let's see what we have when we go back to the state of the infant. He is not just a mass of meat lying there with a tube through him so that food can be given in one form and come out in another form at the other end. He is actually a machine for the interchange of energy and maintenance of equilibrium of energy in which physical energy *is* taken *in* in one form and expended in another, while a little bit of it is retained for physical growth.

A little later he is not an infant any more—he is a child, and his energy is expended in physical energy to maintain equilibrium plus emotional energy. Something has been added.

In adolescent years it is expended in physical form and emotional form, and it begins to show intellectual expenditure of energy. Then when it becomes an adult we find the complete picture of this energy taken in and exchanged and transmuted and expended in physical form, intellectual form, emotional form, and spiritual form. The true picture of the adult is indicated by the degree of spiritual or the quality of spiritual life which he lives.

But, regardless of what life a man lives, the energy expended must be completely expended and equal to the energy taken in, or the increment which is retained becomes greater and greater and greater, and this energy must be expended or just like a boiler without a safety valve, something is bound to blow up.

You call it a nervous breakdown or some kind of technical term, but energy must be expended constantly.

So you say, "How do I begin building my personal biography for my own peace of mind?" The answer is that you must begin thinking constantly in terms of how you can expend physical energy and emotion energy to maintain equilibrium and how you can expend intellectual energy and spiritual energy. We live four lives and as Oscar Wilde said a long time ago, "He who lives more lives than one, more deaths than one, shall die." I assure you that you have four deaths to die and some of us die some of these deaths much before the undertakers take us away.

You may say, "All right, I want to grow up into an adult. How do I do it? I want to know where to go and what to do. I want to go in the right direction and do the right thing."

The psychologist sees one principle for peace of mind, expressed in the experience such as when you park at the curb and somebody is jammed right in front of you and behind you. You want to get away and you cannot wait for those fellows to come out. So you get behind the wheel and start to push and sweat and mutter under your breath. You wear yourself out, and then you start back again. Finally you get to the place where you are just able to get by the car in front of you. But you are heading at an angle. You are facing in the wrong direction.

Suppose you are heading one way, and you want to go the opposite direction. You know that once you put a little pressure on that accelerator and the front wheels are moving ever so slightly, you can—even though you are going in the wrong direction—with the tips of your fingers just turn and go any direction you please. But you have got to be going and moving, even if it is in the wrong direction, before you can go in the right direction.

If you do not want to make mistakes, you might as well fold up and go home and die because you are trying to evade a

basic law of human nature. Motion, movement and action are fundamental in achieving progress in anything, *including peace of* mind. When you are standing still you are not going any place, certainly not in the wrong direction. But you certainly are not going to go in the right direction.

*Is that analogy from real living too* simple? It is the truth, because it is based on a good psychological principle. Whenever we face a new problem, we must go through a process known as trial and error—rambling, fumbling, making mistakes. You might say that you may be doing the wrong thing, but that is all right. Once you are going, you are going through trial and error and that is absolutely necessary for the attainment of insight and ultimate going in the right direction.

In this country we have been taught improperly according to an old European principle. We have been conditioned against trying anything. We have grown up from the time we were children with the impression that if we did anything wrong we would get a smack across the ear, and so we are taught to be afraid of things. If we make a mistake and do it wrong, we know we are going to be punished and none of us wants to be punished. So we have been educated to fail rather than to try.

Apparently the human being is the only phenomenon of nature which attempts to break the various laws of nature as they relate to himself and maybe that is the reason *why he is the only animal* that can create insanities for himself. What are some of these things that he does or does not do? Let's see!

Two plus two equals four. I did not see anyone have a nervous breakdown when I said that two plus two equals four. It always has and always will be a rule that exists, and it has always been true and it will always be true, except in some new kind of mathematics.

*Realistic thinking will also* tell us that it is an unchanging and immutable law that there be birth and death, days of sadness and joy, days of failure and days of successes, days of good things and days of evil ones. It is not good sense to sit down and pray for tragedy or for unhappiness, but it is good sense to recognize that from the beginning of time tragedy and unhappiness has come to every man and every woman who has ever lived and that it will *continue to come.*

Why, then, must we so establish our thinking that we cannot accept an immutable and unchanging law of nature as a simple fact just as we accept the one on two plus two? It is not something that happens just at times. It happens to all of us. It always has and it always will be that way.

Why, when it does come, does this tragedy and unhappiness come as such a great shock? You know why—because we like to think of good things, and we like to plan what we are going to do if everything goes right. But we do not like to think about the bad things and we do not plan for what we will do if things go wrong. That is why you hear people saying, "I just don't know what I am going to do. I am just lost."

I think that there ought to be a department in every plant to remind us to think of what we *will do if something* we are planning does not work out so well as we are hoping it will. What are we going to do if it does not work out? How are we going to handle it if it goes wrong?

Is there a "Wrong Results Planning Department" in your personal life, or do you just look at the most pleasant side? It is realism to dream of success and happiness, but it is good sense to plan for failure and for sorrow, because failures and sorrows and hurts and personal tragedies should be so planned for that they create no more of a ripple in the stream of life than the joys do.

Since most of us try to distort or evade cosmic laws of human nature by bringing up laws of our own, we are suddenly brought up against a stone wall of facts in nature. We might evade man-made laws forever, but the laws of nature can only be evaded temporarily. Those who are persistently trying to evade them get in trouble and wind up in a psychologist's office.

I told you that peace of mind requires a simple faith. It is not the kind of faith which you normally think of as related to a religion. It is something, perhaps, that is merely a part of that faith. It is a faith in human nature. I can well remember when



I was about ten years old my mother told me what a fool I was. I was so darned trusting. I believed everybody. When I got a little older I was supposed to learn better. But I found that when I got to be twenty I was still too young. When I got to be thirty, I began to be skeptical. But when I got to be forty, I began to despair that I would ever learn that human nature is vicious.

Now I am completely doubtful that I will ever discover that my faith in human nature is based on stupidity. I cannot remember ever being taken advantage of or cheated by anybody in anything important or worth while. Can you? If I am going to have to spend the rest of my life or any part of my life looking over my shoulder to see who is going to try to clip me, I am going to lose a lot of the wonderful things that are there before me.

Maybe our friend, John Ruskin, expressed it far better than I can when he said, "Human nature is a noble and beautiful thing; not a foul nor base thing. All the sin of men I esteem as their disease, not their nature; as a folly which may be prevented, not a necessity which must be accepted. And my wonder, even when things are at their worst, is always at the height which this human nature can attain. Thinking it high, I find it always a higher thing than I thought it; while those who think it low, find it and will find it always lower than they thought it."

"The fact is that it is infinite and capable of *infinite height and infinite fall* and here is the faith I would have you hold with me. The nature of this human nature lies in its nobleness, not in its catastrophe."

"Con men" tell us that they have never been able to take advantage of any man except the one who wants to take advantage of some one else. That should be your cue for your own human nature.

Then I think you should have a faith in your own personal human nature. We must believe that evil does exist and that within each of us there is a great potential for good and evil, and that it is natural and normal for each of us to want to do good and to do evil.

We must believe that it is not wrong to first think of doing evil things, before good. It is not weak to be tempted to be unkind. It is normal to be tempted to take advantage of others, and to be vicious. It is normal to want to do the wrong thing. He who says he has never had an evil thought or has not wanted to do an evil thing is a liar or a psychopath.

He certainly is not normal, because it is only the psychic and spiritual vegetable in human form, who is not stirred by the superficial glamor with which these evil things and dishonest profits may enwrap themselves, and it is only normal to think first of doing the wrong thing.

We must consider that when we meet a situation that we have never met before. It is fundamental human nature to go through the process of trial and error and wrong doing in order to arrive at the insight which is the end good. It is normal first to want to do or to do the evil thing and it is not weak, and this should not be used as a basis for self-depreciation and internal conflict.

The superficial glamor is fine, and the superficial joy of victory or gain may seem good. It gives us the incentive perhaps for unethical or evil practices. But we also have the capacity within ourselves to stop and examine again that which is evil and when we do have the courage, not to run from the thought that we may be tempted but to face it, we may then lift the cloak of glamour and look beneath it and say, "That is not worthy of me."

After you have said that it is not worthy of you, *there is no inner conflict. There is* no inner turmoil. There can be peace of mind.

Yes, you may have faith in your own human nature. Doing the wrong thing is part of trial and error.

You cannot lift a thousand pounds with one hand. But you are not worried about it. Your peace of mind is not the least bit worried or distressed by it. You cannot solve problems that would be simple for Einstein. You know that they are beyond your qualities, capacities and limitations.

Once you know your own limitations, your own capacities, your own weaknesses and your own strengths, you are not disturbed any more. You do not run against the stone wall of those limitations, and you do not set lower standards of performance for

yourself. You will be able to work up to these limitations.

Last year we talked about taking that inventory, and we said that no business man can hope to stay in business unless he makes a study of this business once a month, or at least took inventory once a year, to see things good and bad, check the stuff he had in the warehouse, in the stockpiles and on his shelves.

Maybe you would rather run around in a squirrel cage than to take the time to do some personal inventory checking or personal analysis. It is easy! There is always somebody who will tell you what is wrong with you. Instead of saying, "Well, is that so? Let me tell you what is wrong with you," instead say, "Let me go into my room, turn out the lights, pull the shade and look up at the ceiling and examine myself to see if these things are true."

Devout Catholics have a wonderful psychological principle in confession. Next week I am not going to have any classes at Loyola University. It is a Jesuit school, a good place for a person coming from a good old-fashioned Jewish Orthodox home. He is safe there! There is no conflict in our thinking, basically. But they will not have students coming to class next week, because the Catholics have what they call "Retreat," which is a time for getting together with yourself, examining your own soul and your relations with God, your fellow man and yourself.

Maybe we all ought to practice a retreat of some kind.

Do something on inventory. You ought to know something about your own limitations and abilities so you don't under-place yourself or over-place yourself.

Always bear in mind this principle of trial and error, whenever you run across any new situation or problem which you have not handled before. You must go through it whether you like it or not. It could be used as the basis of self-education, and you must go through that process, uncomfortable as it is.

You may not be able to carry a thousand pounds from one end of the room to the other with one hand. I can do it—and with one hand. If you had a thousand pounds of scrap metal here and said, "Pick it up and carry it over there," I would do the same thing you do in industrial practice. I would take that thousand pounds of scrap metal and put it in little containers of ten pounds each. I would pick it up and carry it over. I might make a hundred trips, but I would get it there by using only one hand, and that is what happens when you who are disturbed go to the psychologist with a problem.

The psychologist does not look at it as a single mass. He knows that no human problem exists as a single entity in itself and as a unit. He knows it consists of parts just like a wheel on a wagon, and a wheel is a wheel until we take the hub and spokes and rim apart. Then it is no longer a wheel. It is just parts.

When he takes your problem, he is not interested in the problem as a mass of a thousand pounds. He wants to take it apart. He breaks it down into its components and deals with components. Then it is not a problem any more.

Why don't you do that with your own troubles? A psychologist never tells you anything. That is the common complaint. "I don't know—he didn't say a word. All he did was to ask me questions and just listen." But when that happened, you forgot and walked out and said, "Thank you Doctor, you helped me very much." All he did was to ask a question or two and give you a chance to describe the parts of the problem.

At the same time the psychologist also recognizes the great principle of catharsis. The confession is catharsis. You cleanse yourself.

Why doesn't each one of us find at least one person, either a friend or the wife or husband or mother or father or doctor or clergyman or priest, who will be a psychological big shoulder, a weeping post, a great big ear to whom you can talk and get things off your chest? Otherwise it accumulates, and festers throwing off its mental poison. Everyone must have someone, and you do not have to wait for the psychiatrist.

You may remember that we talked last year about the principle of profit which we would have from a successful business. There is the principle of profit which says that when I make a profit it is only because you have given me some of your money for something which I have given you. If I want to make profit from you, I am not going, to continue to make a profit unless I serve you. You do not want to do business with me because I make a profit. You want to do business, because I do something for you. Therefore profit in business is the end product from services rendered to somebody else.

That is an old principle. There may still exist for some of you in your sects the concept of tithing, in which a portion of your income has been returned to the church. Basically, the psychologist who tries to deal with you when you are disturbed tries to discover for you or help you discover a means where you can give a portion of your time every day to somebody else. That is a psychological tithing, a spiritual tithing. That is something you should do for peace of mind.

There is no person living who does not yearn for sympathetic understanding. Appreciation will be given in return for appreciation, and understanding will be given in return for understanding. It is a natural law and it has always been true and always will be. Affection will be given in return for affection. What you get will always be a mere reflection of what you give. That is a wonderful principle if you are looking for human relations in industry.

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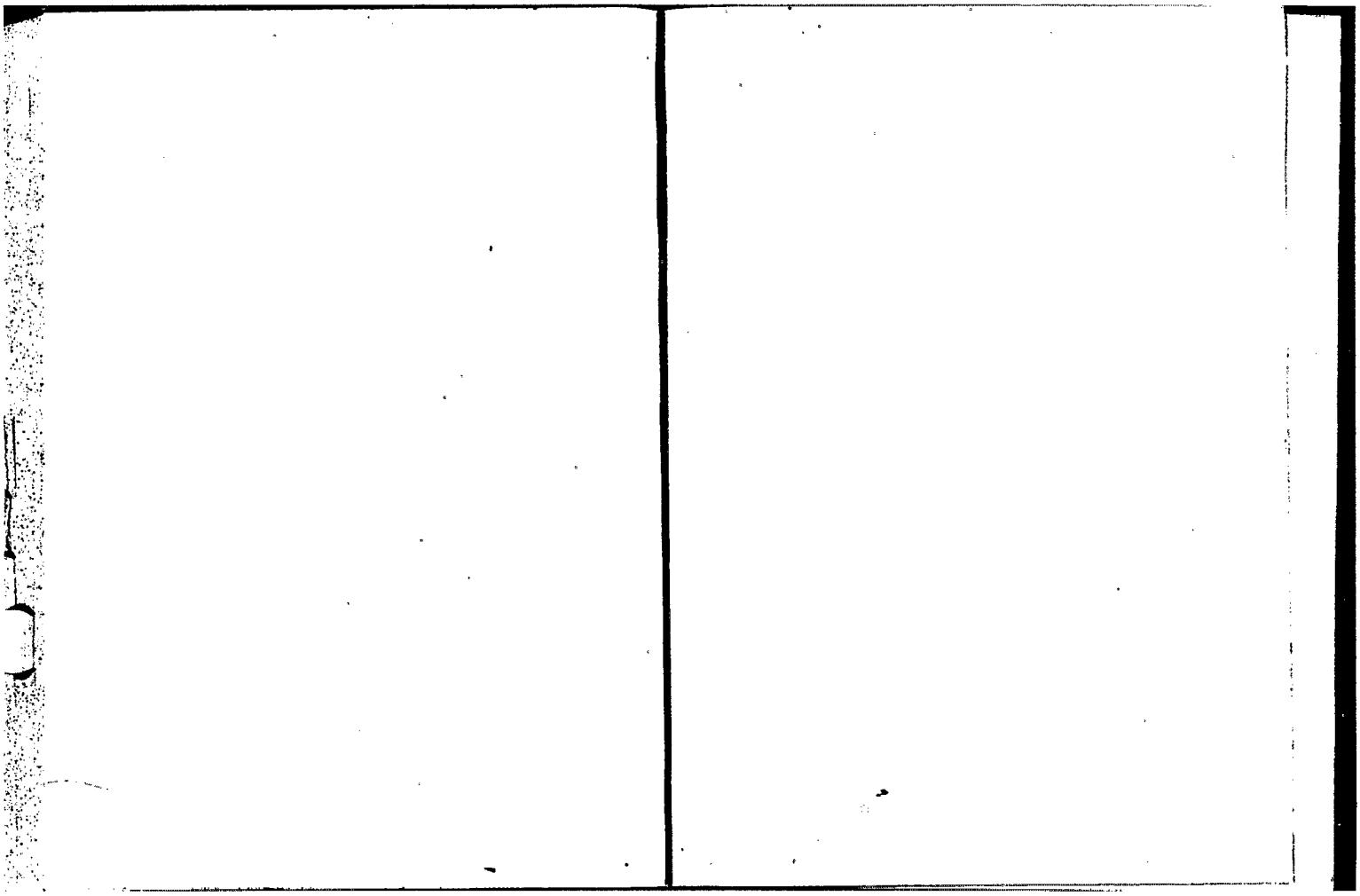
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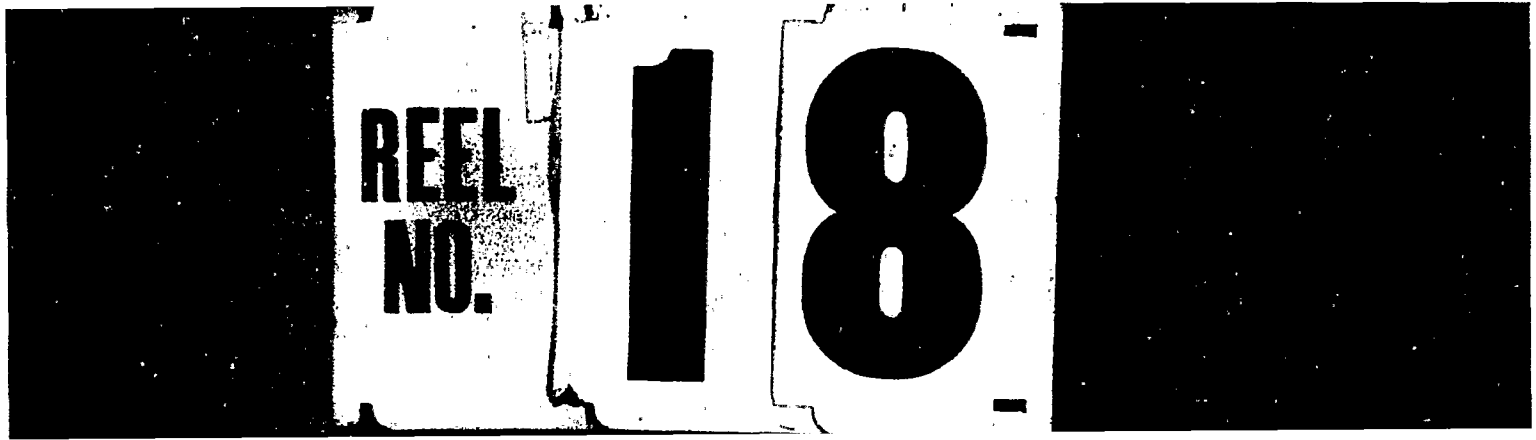
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a flat surface, fall flat when it is in position between the car and dock. The driver needs to dismount and raise the lugs only once, when removing the board from the car.

In storage, heights of 12 to 15 feet may be reached. This greater utilization of height more than compensates for the volume of the pallets themselves.

If the load is going to a place which cannot be made accessible to the trucks, we use steel dollies with fork guides built in. Quick-detachable handles are snapped on one end as a tongue for steering.

In many cases ramps or elevators are not practicable for one reason or another, as is the case with a new building at our plant. A monorail beam protrudes from a wide doorway, and carries a two-ton electric hoist. We use this specially-made lifting tool to take a small fork lift truck (empty) to the high level.

Horizontal travel on the monorail is about fifteen feet and done by a geared handwheel. Incidentally, this planned, routine procedure has been done many times without incident. Without job engineering, it would be virtually impossible and certainly dangerous.

With one truck on the higher level to receive and store pallets, another on the ground now brings up the loads. This is a large machine with a two-ton rating. Only one man is needed to hook the pallet sling into the overhanging edges of the pallets. We find two truck operators, one hoistman, and one sling handler can move and stack about 25 tons of material an hour with the setup.

For single-drum deliveries of lubricants to racks, we carry the drum in a home-made rigid grapple, rather than the usual chain and hooks, because with this type the driver can handle every operation without assistance. There are no mashed toes or hernias involved in his tipping or righting full drums with his mechanical arms.

Where traffic volume justifies it, as in our storeroom, we use an all steel hydraulic elevator.

We have made a platform from scraps of grating, complete with streamlined handrail. This is, in effect, a one-ton portable elevator with a 12-foot lift. Sometimes, the electricians borrow this platform and service all our yard lights in a few minutes. No ladders, no falls, no accidents.

Irregular objects are a problem, met with topless and bottomless crates placed on the pallets. We make these of scrap lumber.

Need to move your topheavy welding machine? First, weld box section guides on the bases of the machines, into which the truck forks may slide. After that, just whistle for the fork lift.

For such operations as handling small grinding media (which at our plant are added directly to the feed mechanism of our tubemills), we have developed a portable hopper. It rests on low steel skids. The forklift truck operator is charged with the responsibility of filling this container as the need arises, a task accomplished by driving to the department, picking up the hopper, driving on to the media storage bins, shoveling it full, driving to the scales and then back to the finish grinding department—all accomplished by one man in 25 to 30 minutes.

Once the mechanical handling habit is established, the old causes of accident will diminish.

Your injured worker could not have been hurt the modern way—he had to get his injury the old, old hard way—climbing with a load, falling off a ladder, reaching into a switchbox, touching moving machinery, or, at many times the cost, at a much slower speed, just helpin' move something.

Why don't you stop that?

---

# Human Relations in Industrial Safety Work

By NATHANIEL CANTOR

Chairman, Dept. of Sociology, University of Buffalo, Buffalo, N. Y.

Although industrial accidents are often the result of faulty equipment or hazardous surroundings, sometimes accidents are the result of the *attitudes* of the worker. The present discussion limits itself to those accidents which result from disturbed human relations. Something is wrong with the operator, not the machine. The employee may be impulsive, irresponsible, fearful, depressed or worried. He is inattentive, uninterested and fails to recognize potential hazards.



How can we deal with psychological hazards in industry? There are two approaches, one through the clinical study of the individual who has been in an accident and the other through the safety education of groups. The clinical study of the individual should properly be the responsibility of one professionally prepared to deal with psychological difficulties. The better approach, obviously, is to establish the kind of employee morale which would reduce the incidence of accidents.

There are two questions, (1) how is this improved morale to be established and (2) who is to do it? Supervision, it seems to me, has the responsibility of improving safety morale, and it is to be accomplished through increased insight on the part of supervisors concerning the factors of excellent employee morale.

Employee's attitudes toward safety rules and observances are, in large measure, a function of their attitudes toward their supervisors. The attitudes of supervisors toward their employees depend, in turn, upon the supervisor's understanding of people. Supervisors cannot understand what makes workers tick unless they understand themselves.

The issue can be restated in a simple way. How can workers be helped to become more responsible, self-disciplined employees? The answer is, by providing them with responsible self-disciplined supervisors. How, then, do we obtain responsible, self-disciplined supervisors?

Let me first state my conviction that industrial morale generally and safety morale specifically are not readily acquired by reading pamphlets or hearing reports or by listening to monotonous lectures by safety directors even when they are followed by sandwiches or Mickey Mouse films as an added incentive to attend safety meetings.

The great need is to develop supervisors with a knowledge of personality development and the skill to employ that knowledge in day-to-day relations with their employees.

This is not a two or a ten-hour job. It requires a well planned program lasting one or more years.

Obviously, there isn't much point in setting up programs for the development of supervisors in better employee-morale until the nature of employee-morale is understood.

A promising start has been made in discovering why men work. We now know that the traditional answer, they work to get money, is too simple. Indeed, turn the question around and inquire, "Why is it that when workers receive high wages (the war years, for example) production is not only not maintained but, often, falls?" Management pays fair wages and complains about production, absenteeism, quality of product, grievances, labor troubles, and so on. Apparently the reasons for inefficient production are not merely a matter of pay.

The field research, especially by the social scientists in our schools of business administration and departments of sociology, has illuminated what the demands of the workers are. We know that industrial plants are not merely factories where people produce goods. They are also communities where people associate.

Industry is also a society. People who work together expect not only income but also status, prestige, deference. They want to feel important in their own eyes and recognized by others. They want a chance to participate in their own creative way in the job they perform. They want the opportunity to have a part in the thinking and planning of what they do. They want to see the significance and meaning of their work activity. The job must carry genuine interest for the worker to be psychologically effective and, hence, more efficient. We work better, with our head and heart, as well as our hands, when we are genuinely interested in what we are doing.

This appears so obvious that one wonders why it wasn't recognized earlier. Yet most leaders in management, labor, and government failed to take account of the non-money demands of employees and, for that matter, some still fail to appreciate these basic expectations of workers.

Reliable research workers in community and group studies including industrial areas, have given us enough valid data from which we can draw definite conclusions about human relations in industry. Workers are not

