

1973

National Safety Congress Transactions

Public Safety

PLAINTIFF'S EXHIBIT

NSC-253



National Safety Council
425 North Michigan Ave.
Chicago, Illinois 60611

Public Safety Sessions

BATTLE AGAINST BLINDNESS

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The miracle called eyesight is a faculty so complex, so intricate in design, that the inquiring mind of man has yet to fathom all its secrets. With but the faint light of a full moon, the magic of seeing in monochrome becomes possible. And as the night gives way to dawn, the eyes perceive colors as well, and the full potential of vision can be realized. Such accomplishments have yet to be equaled by the finest camera lenses and the most sensitive films.

It would seem reasonable to expect that man would treasure his ability to see so highly, that he would constantly guard it against threats posed by environment, occupation, and avocation. Yet, except for protecting his eyes at times and in places which instinct or experience tells him are especially dangerous, man seems strongly inclined to consider eye safety as something that everyone but himself need be concerned about. Statistics on eye injuries and loss of sight bear witness to his folly.

As with all human capabilities, eyesight varies throughout one's lifespan, reflecting the effects of disease, misuse, aging, and accidents. Quite often these effects lead to occasional or full-time use of eyeglasses. Paradoxically, the very lenses which give comfort and make seeing a pleasure at work, at school, at home, and in leisure pursuits also pose a potential threat to the security of vision.

It would take but a fraction of the skills, time, and energy that are used to remedy eye damage from broken eyeglass lenses, and from other types of eye accidents, to prevent it from happening in the first place.

There are many look-alikes in the world, but even so-called "identical twins," when you take time to study them carefully, usually prove to be quite different, to have very definite individual qualities which set them

apart. This fact was never more true, or more important, than when applied to the type of eyeglasses being worn by millions of children, teenagers, and adults. Eyeglasses appear to duplicate one another in every detail. But are they really twins? Will close examination prove there is much more to know about glasses than first meets the eye? While eyeglasses may look alike, they can well be strikingly different!

Lenses were deliberately broken to prove an important eye-safety point. What caused them to break? A light blow from a teaspoon broke one lens into sharp pieces, pieces that could easily lacerate or puncture an eye. But it took several sharp blows with a machinist's hammer to break another lens, and even though shattered it still clings together in an eye-protective network. What made one lens much safer than the other?

The "secret ingredient" that made one lens so much stronger than the other is a lens-hardening furnace. The lens which held together, even though shattered with a hammer, was heated in a furnace to over 1,100 degrees Fahrenheit and then suddenly chilled with cold air jets. Chemical toughening is another method of strengthening lenses. Steel required to have an especially tough outer skin is case-hardened in much the same way. Shatter-resistant lenses of optical grade plastic—which need no heat treatment—are also available. Visual correction—even bifocal and trifocal—can, of course, be worked into either type of lens material.

To make doubly certain the furnace has done its work well, the toughened lens is checked with a Polariscope for various tell-tale safety markings. After determining that the lens has a correct pattern for eye safety, its resistance to impact is tested. A steel ball-bearing is dropped more than four feet onto

the front surface of the lens; if the lens doesn't break it's ready to be fitted into an eyeglass frame. Protective lenses for off the job are usually about 2mm thick, about the same thickness as most streetwear lenses. An additional millimeter in thickness is required in lenses intended for use in industry, school labs, and shops.

Talk about a close call! A woman had an eyeglass lens smashed, not by some heavy object, but by a soft rubber ball thrown by a child. The razor-sharp glass fragments were pushed in toward her eye until they actually scratched her eyelid. How much sense does it make for anyone—child or adult—to come “within an eyelash” of blindness when protective lenses are so practical, and cost so little? When you stop to think about it, you can't help but wonder why all eyeglass lenses in the world aren't the protective kind.

Furnace-hardened lens worn by a workman deflected a stone snapped into his face by a passing vehicle—an accident which could happen to anyone. The lens held together because of the hardening and the grip of the sturdy frame. The one small glass fragment jarred loose by the impact fell away from his eye, as usually happens when safety lenses are broken. Fortunately for all concerned, safe-guarding the eyesight of millions of industrial workers with safety eyewear has been a standard and successful practice for more than a quarter of a century.

In the total visual process the eyes relay a continuous stream of pictures to the brain through the optic nerves. Because of this eye-brain relationship, any damage to one eye can, through sympathetic reaction, involve the other eye. When this happens, even complete loss of sight in both eyes is a very real possibility. That's what makes it doubly important to protect both eyes at all times.

Now let's turn our attention to eyeglass frames and find out if they, like lenses, also have quality or design features which make one type better than another. An ordinary lens is pressed into a street-wear frame from the back toward the front; in other words, from the side of the frame which will be next to the eye when the glasses are worn. From the standpoint of eye protection, this is a design weakness of considerable significance.

When a lens in an ordinary frame is struck by some object, if the lens somehow doesn't break under the blow, chances are it will be driven out of the frame and toward the eye. So the conclusion must be drawn that ordinary eyeglass frames are not made with eye safety in mind.

In making up safety glasses, the lenses must be inserted from the front of the frame, and for a most important reason: the opening on the side toward the eye is smaller than in front. This design feature prevents a properly fitted safety lens from being knocked out of the frame and against the eye, even when the impact is severe. The protective shoulder on the side toward the eye helps absorb impact energy and helps keep a cracked lens or broken lens fragments in the frame and out of the eyes. A snug fit between a safety lens and the safety frame is guaranteed by the sharp “Vee” design. Too bad all frames and lenses aren't engineered this way—hopefully, one day they will be.

It takes just over two seconds for one foreign streetwear frame to be set ablaze with a kitchen match. A decorative candle on your dinner table, or a gas stove flame, would torch it off even faster. Safety frames resist severe heat, even the blast of a blowtorch. While the average person wouldn't dream of putting his eyeglasses to such a test, having frames which won't burn easily is a distinct and important advantage.

Someone once said, “There is hardly anything in the world that someone cannot make a little worse, and sell a little cheaper . . .” and eyeglass frames and lenses are certainly no exception. While it's fun to hunt for bargains, the line ought to be drawn well before you entrust the only eyes you'll ever have to flimsy frames and shoddy lenses. Professional eye care and top-quality eyeglasses are rarely available at bargain prices. No matter what eye hazards might be encountered in and around the home, on do-it-yourself projects, while enjoying a hobby or sports activity, or while working as a school or college lab and shop student, there is safety eyewear suited to your needs. All such safeguards for eyesight are built to rigid safety standards, all are inexpensive, and all can be obtained quite easily.

That top-quality safety eyewear costs so little will no doubt be a pleasant surprise to many of you. Why trust to luck when you can guarantee your vision, so to speak, for about what you pay to go to a movie? Where can you buy them? The Classified telephone directory should indicate several sources. Check listings such as “Safety Devices” or “Industrial Equipment and Supplies,” or get the information from the local safety council, an industrial plant, the Prevention of Blindness Society, or your Health Department.

Much of the pleasure and enjoyment we get out of everyday living is derived from being able to see. Far too many learn the hard and painful way that it seems easier to lose the precious gift of sight than to keep it. Flowers and shrubbery look no less beautiful through safety eyewear, and power tools which ease homemaker chores are just as efficient with eye protection in place. Your eyes have to last you a lifetime. Take care of them. Protect them.

Almost everyone will agree that tinted lenses provide pleasant relief from glare at the beach, from sunlight snow, and while driving during daylight hours. But what many don't realize is that depth of tint has little effect on eye comfort. The type of materials used in making tinted lenses is what determines their efficiency in guarding the eyes from annoying or injurious light rays. That's why the darkest glasses on the bargain counter sunglass display usually prove far less satisfactory than lightly tinted ones purchased from a more reputable source.

While style in sunglasses is important to children and adults alike, the recommendations about safety frames and shatter-resistant lenses should also be kept in mind. And if you normally wear glasses, then you may wish to have your correction worked into tinted lenses rather than see the world as a blur through non-prescription sunglasses. In any event, don't make a habit of wearing sunglasses any more than you have to. Don't wear them indoors and, whatever you do, don't wear them while driving a car once the sun has gone down.

Contact lenses present a unique method for overcoming visual deficiencies . . . through placing a corrective lens right on the

eye itself. This tiny disk, carefully machined from optical-grade plastic, not only incorporates the required visual correction but duplicates the exact contour of the patient's eye. While not suitable for everyone, or as a substitute for eye protection, contact lenses are being used successfully by a growing number of teens and adults, including many amateur and professional athletes.

Satisfactory use of contact lenses depends in large measure upon the competence of the professional examiner and the willingness of the patient to follow instructions. There is general agreement among leaders in this field that contact lenses are safe if the lenses are very carefully fitted by an expert and if the patient has periodic examinations to be sure no harm is coming to the eyes.

Actually, contact lenses do not rest directly on the eyeball, but on a microscopic layer of fluid, otherwise irritation and even serious eye damage could result. Should a speck of dirt or chemicals get between the lens and the eye, the contact lens should be removed at once, the eye flushed thoroughly with water, and—if discomfort persists—medical attention should be sought without delay. As helpful as contact lenses can be, their use for extended periods each day, or while sleeping, is not recommended. And don't lose sight of the fact that contact lenses are not a substitute for protective eyewear, either on or off the job.

The next time you get something in your eye, don't rub it, and don't let a well-meaning friend or a member of the family attempt to remove the particle, even with a clean handkerchief. Do-it-yourself eye care can scratch the delicate surface of the eye and cause real damage. Lift the upper lid over the lower lid and let tears wash out the speck. If this doesn't work, or if you suspect that a foreign body may have penetrated the surface, cover the eye with a clean patch and seek medical attention without delay.

Keeping a home sparkling still entails hard work, no matter how easy it is made to appear in television commercials. And the new super-cleaning fluids and detergents that best “Brand X” by a mile need to be kept out of the eyes the same as did the old standbys. When common sense tells you to

use rubber gloves and a sponge when you're washing woodwork and walls, watch out! If your hands need protection, so do your eyes!

Quick action! That's what's called for when strong detergents or chemicals get into your eyes. Don't waste a second by telephoning a neighbor or even your doctor. Get to the sink or bathroom shower, pull your eyelids wide open, and flush your eyes thoroughly. And medical authorities say that means for 15 minutes. The longer you delay in diluting the chemicals the more serious can be the consequences. Of course, when you use eye protection you don't have to worry about hurting your eyes.

Accident statistics prove year after year that when it comes to getting hurt, especially where eyes are concerned, there's no place like home! What really keeps at-work eye damage and loss of sight from leading the accident hit parade is good eye health practices and the proved effectiveness of safety

glasses, and other types of eye protectors. If the many millions of ordinary glasses and sunglasses in the world could be changed by some magic into the safety kind, one of the most dramatic prevention of eye injury and loss-of-sight advances in history would be accomplished. And until all eyeglass lenses do provide protection as well as correction and comfort, the vision of much of mankind will continue needlessly to be endangered.

So, through taking time to closely examine eyeglass lenses and frames, we have learned many facts, all important to everyone who values his vision. The magic of eyesight—man's most priceless possession—is rarely appreciated at full value until it begins to fail or until it suddenly is dimmed or lost forever through accident. Then it's too late. Eyesight is worth far more than the few pennies that might be saved on cut-rate eye care and non-protective glasses. What value do you place on your vision? Well, then, *protect it.*

SWIMMING POOL SAFETY

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In the past few decades we have seen a spectacular growth in the number of swimming pools. In the U. S., private residential pools, which were once a status symbol for wealthy individuals, are now within financial reach of a large segment of the population and have increased in number from an estimated 2,500 units 30 years ago to more than one million units in 1973. Virtually every apartment complex, motel, and urban housing development constructed within the last 10 years has included a swimming pool as standard equipment. The number of community pools has also increased correspondingly. Also, many schools that are being built today have in their plans provisions for a swimming facility for our youngsters.

This rapid growth in the number and availability of pools, which makes those of us who love the water very happy, has brought with it a deep concern for swimming pool safety and an increasing awareness of the need for education and control in order to protect us, the consumer.

Drownings are now the third leading cause of accidental death in the U. S., exceeded only by motor vehicle accidents and falls. *Accident Facts* (1973 edition) indicates about 7,600 persons drowned in 1972. This figure includes drownings at all water sites. Approximately 600 of this number were victims of swimming pool accidents. Three hundred of the swimming pool fatalities were in home pools and an equal number in public or semi-public pools. Approximately 750 persons drowned in home accidents, excluding the 300 in home pools; we find it surprising that 200 drowned in bathtubs, 60 in wells and cisterns, and 80 in open bodies of water; 110 drowned in unspecified places. I make this point for the purpose of indicating that the

same safety procedures utilized around the swimming pool can and should be utilized around other water areas at which an accident could happen.

If we consider that 600 persons lost their lives in swimming pool accidents, and we know that in the last 10 years the rate per 1000 population has actually declined, we may feel somewhat complacent with the job of safety that is being done in this area. However, let me assure you that swimming pool safety is a matter of very serious concern for all of us who deal with it daily and should be of major concern for those individuals that may utilize or construct such a facility in the future.

Since July 1972 the CPSC has been receiving reports from 119 selected hospitals throughout the country on the number of swimming pool product-related injuries treated in the emergency rooms. The commission devised a system based on reports from these hospitals which allows for national projections of the total number of injuries. Based on this system, it is estimated that during the fiscal year ending June 1973 approximately 42,600 persons in the U.S. suffered injuries associated with swimming pools (including inground, aboveground, and wading pools) that were serious enough to require emergency room treatment. This number does not include persons treated at home or by private physicians. Nor does it include deaths that were other than emergency room admissions. If we consider this aspect of the problem, it is estimated that 100,000 people suffer injuries associated with swimming pools in this country each year.

This CPSC system of receiving and tabulating reports from selected hospitals provides us with an overall picture of the number and characteristics of accidents and

allows selective in-depth investigations of the product-related injuries.

Since the reports received ended June 30, 1973, a total of 1,875 persons were treated in the 119 selected hospitals for injuries sustained in swimming and wading pools. More than 75 per cent of this total were related to inground pool accidents, 23 per cent to aboveground pool accidents, and two per cent to wading pool accidents. The age group most often injured was seen to be teenagers and children, particularly between 10 and 14 years of age. Approximately three-fourths of the victims were less than 20 years of age; 65 per cent of the total were males (and this percentage remains stable until we reach the young adult category, where the percentage moves to 70-75 per cent).

The overwhelming majority were not serious enough to require hospitalization, since 96 per cent of the victims were treated and released. However, as it relates to product-related injuries, it is interesting to note that lacerations, contusions, and abrasions composed at least half of the injuries treated. Fractures, strains and sprains, concussions, and submersions were other types of injuries in descending order. Of these types of injuries, submersions are potentially the most life-threatening but were responsible for only three per cent of admissions. However, half of the submersion victims were less than five years old. Submersions also accounted for one-fifth of the total number of injuries to children under five. (Submersion as a term is used instead of drowning, which is usually understood as implying death.)

The site of the swimming pool accident was equally divided between home and public, although the percentage of accidents varied with the pool types. Thirty-one per cent of all inground pools, 59 per cent of aboveground pools, and 56 per cent of wading pools were reported to be located at the home. Proportions located elsewhere were 37 per cent for inground pools, 19 per cent for aboveground pools, and 26 per cent for wading pools. There were many accidents in which pool locations could not be determined or were not specified.

The CPSC as of June 30, 1973, had conducted in-depth investigations of 60 acci-

dents involving swimming and wading pools; 42 of these involved inground pools, 14 aboveground pools, and four involved wading pools. Sixteen of the accident situations involved jumping or diving and were equally involved in jumping and diving from the side of the pool and from the board. Injuries off the diving board generally involved the attempt of the swimmer to do difficult dives, with the swimmer hitting the edge of the board or the bottom of the pool. In a few cases, the victims lost their balance while jumping and fell on the pool deck or board, or both, and injured themselves.

Eleven accidents concerned the use or misuse of pool accessories (other than diving boards). Several persons fell from ladders going to high diving boards which had no handrails or rubber treads, and the accidents resulted in skull fractures which required hospitalization. Numerous people fell and cut themselves on ladders at aboveground pools. Four of the ladders being utilized were without handrails and were shaky and unstable. One ladder actually came apart under the weight of the victim. Several persons were cut by protruding edges on ladders.

Two persons were injured on pool slides. One of these sustained injury when a swimmer coming down the slide hit the victim, who was standing in the pool. The other injury was sustained by a child running in the pool area who ran into the slide.

Swimming pool filter tanks were implicated in two serious accidents. These tanks were composed of two parts held together by clamps. After accumulating pressure in the tank the top of the tank was blown off, causing in one case very serious facial lacerations, and in the other case a fractured skull. Both of these cases required hospitalization.

Slippery surfaces around the pool or surrounding the pool was felt to be a common hazard and was responsible for 10 accidents. Four persons slipped on surfaces surrounding inground pools, and in these situations no one type of surface was common. Five persons fell on the slippery bottom surfaces of empty or nearly empty pools.

Injuries due to the sharp edges in the pool area caused three injuries, and seven persons were injured in what could be termed miscel-

laneous accidents which involved "horseplay" in the water. Although none of these accidents were serious, all involved a hazard in the product or carelessness or ineptitude on the part of the victim.

There were several other miscellaneous accidents, such as falling from the deck of an aboveground pool, strains received while emptying a wading pool, and falling into an empty pool.

Without question, the most hazardous situation involved non-swimmers who fell or jumped into deep water. Four of the accidents investigated were of this type. Two of these involved toddlers two and three years of age. One involved a 12 year old who drowned while showing off. He jumped into deep water and was unable to swim to safety. Another fatal accident occurred when a nine year old boy, playing hooky from school with his friends, wandered into an apartment swimming pool area which was unattended. One gate of this pool was missing from its fence. The other was open and unlocked. This young man's friend fell into the water, and he attempted to save him by jumping into the water also. The friend was pulled out by others on the deck, but our would-be rescuer drowned.

A third drowning occurred in a public park when a lifeguard found a 10 year old on the bottom of the pool in seven feet of water. How this accident could occur in a guarded area is unknown.

These are facts and figures obtained from in-depth investigation of the 60 accidents. I am sure that the implications to product-related safety are very plain, as well as those general rules of conduct which were not observed or practiced in these particular situations.

It is obvious that safety at swimming pools must be approached in many ways. Very definitely, it must be improved. First, there must be adequate minimum standards for pool construction, pool design, and pool equipment. The National Swimming Pool Institute has published standards for private and public swimming pools which cover pool dimensions, depths, slopes, slides, diving equipment, electrical recirculation systems, inlets and outlets, water supply, skimmers, filters,

pumps, valves, chemical feeding, and wastewater disposal.

These standards were designed and published with safety in mind and are very valuable as far as they go. Possibly they should be re-examined in light of the hazards indicated by these in-depth investigations. For example, there have been at least 15 very serious accidents this year involving permanent spinal cord damage in which the individual was utilizing a pool slide that was placed at the shallow end of the pool. The victims of all but one of these accidents descended the slide head first into shallow water. The only victim who descended feet first sustained multiple leg fractures upon entering the shallow water.

Another area of concern involves electrical wiring, particularly as it relates to its use with portable swimming pools. The National Electrical Code, which was adopted as law by most cities, counties, and states indicates that most electrical equipment used with this type of pool have ground fault circuit interrupters to protect against accidental electrocution. This requirement went into effect January 1, 1973. However, I firmly believe most consumers and possibly some retailers would not be aware of it. I do know that ground fault circuit interrupters in some cases are not included as part of the pool equipment purchased by the consumers.

Other areas of concern relate to minimum water depth for pool slides. Also, what requirements should there be for slip-resistant surfaces? What requirements should there be for the sloping bottom surface and the marking of pool depths? And what can be done to prevent serious accidents involving exploding filter tanks and the structural failure or collapse of aboveground pools? This comment on structural failure of aboveground pools would strongly indicate that standards should be developed to insure the integrity of the structure of these pools. Last, but not least, all pools using electrical equipment should conform with the National Electrical Code.

There is also a very definite need to have standardized regulations governing supervision of an ever-increasing number of apartment, motel, and urban housing develop-

ment pools. There are reports of deaths occurring in these types of unsupervised yet easily accessible pools, which are filled but untended.

A well-coordinated effort toward public education as it relates to swimming ability and swimming safety is vital for the reduc-

tion of swimming pool accidents. The American Red Cross, the National Safety Council, the YMCA, and many other agencies in the field of aquatics can provide valuable assistance to you on public education problems in the field of water safety.

THE HOME FIRE MANAGEMENT PROGRAM

By REXFORD WILSON
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On Christmas morning, author Vance Packard was burning wrappings in his fireplace. Flaming scraps of paper flew up his chimney and ignited his wood shingle roof, causing considerable damage and the loss of many Christmas presents and family belongings. Fortunately, no one was killed or injured.

A young lawyer for a major firm was not so fortunate. He and his wife had bought an old home. One of his first projects was to strip the paint from the woodwork around the fireplace and apply linseed oil on the now bare wood. The evening was cool so he lit a fire in the unscreened fireplace. He had never had a fireplace before.

Later that night while the family was asleep, a blaze started near the fireplace and killed the young lawyer, his wife, and four of their five children.

Cases like these need not happen if homeowners knew how to "manage a fire-safe home."

Much has been said about the vague term "smoke and toxic gases." In actual home fires, we see the marks of finger scratches on doors that people have used for ten years where they tried to claw their way out instead of turning the door knob. We have seen children and adults stand inside windows in their burning home waving at people on the ground below who are yelling to them to jump. We find people who have lived in a house for a long period of time entering closets and bathrooms instead of using the normal stairs. These signs of confusion, inability to think, and irrational actions abound in the fire study literature.

While it is possible that some esoteric material is causing these difficulties, much more likely are the known factors of lack of oxygen, increased carbon dioxide, and increased carbon monoxide. Flame is a voracious consumer of oxygen. The oxygen content in homes

drops rapidly as open flaming grows. The lack of oxygen causes mental difficulties and inability to physically respond.

As burning continues with decreasing oxygen, carbon dioxide is generated. Carbon dioxide causes intense motor difficulties and inability to think rationally. As the fire continues, carbon monoxide is created and in very small quantities this gas also causes inability to react properly.

Together all three rapidly reduce a human being's ability to respond properly.

Alcohol and drugs in the blood stream also seem to increase the sensitivity of the human being to these gases.

While the change in these gases in a clear atmosphere would affect a normal human being, the presence of particulate matter, generally called "smoke," increases the sensitivity of the human being to these changing gas concentrations. Smoke enters the throat passage and causes immediate swelling of the throat membranes, restricting the air passage and allowing less air to enter the lungs. The particulate matter mixes with the liquids in the lung, creating a substance very akin in appearance to India ink. This India ink-like material coats the small passages in the lung, making it more difficult for oxygen to reach the blood stream. The final insult is the inhalation of carbon monoxide, which clots together certain oxygen-carrying portions of the blood.

The net result of the synergistic cocktail of changing gas concentrations and the inability of the body to get oxygen from the air into the blood stream produces relatively rapid intoxication and collapse of the normal bodily physical energy.

We must not live in fear of fire. Fire is not a theological problem. Faith, hope, and charity are not ways to deal with the fire problem. Fire is a physical and chemical phenomenon and as such can be designed and controlled.

In most cases the ignition of a fire can be prevented. When ignition cannot be prevented, the flames' growth can be slowed and the reaction to the presence of flame in the home can be accelerated. These are the five basic steps to home fire management:

1. *You can keep fires from starting.* All fires start from thermal energy. The energy source will vary from malfunctioning electrical equipment to the misuse of a match, to the improper discarding of a cigarette.

One vital key to the control of ignition hazards is proper selection, installation and use of equipment.

Selection of power consuming appliances should be made from equipment tested and listed by Underwriters Laboratories. The UL label indicates that tests to guard the public with reasonable safety have been performed.

Several years ago an inexpensive extension cord with inadequate insulation for U. S. electrical service was brought into the United States. A number of fires occurred before these cords could be removed from the market. Guard your house from unnecessary ignitions by insisting on UL listed equipment.

After you have purchased adequate equipment, you must see that it is properly installed. Many home owners are skilled persons in specific areas. Some are skilled electricians, some are skilled plumbers. If you don't qualify and if you are dealing with critical power-consuming appliances such as furnaces, dryers, and ranges, pay the extra money to have a professional do it properly.

It is important that equipment be used for the purpose for which it was designed. Using gasoline in a washing machine to clean oily overalls, or thawing frozen pipes with a plumber's torch is only asking for trouble.

Children with matches, cigarette lighters, and candles are, of course, a random thermal energy source which always requires alertness on the part of their parents to prevent ignitions.

Large ash trays with internal supports for the burning cigarette provide greater thermal energy control for discarded smoking materials.

Random ignition sources will find it harder to work in an alertly controlled home. To be avoided are cases like this:

One morning a six-year-old boy got up, ran downstairs to the living room, and plugged in the television set. A known faulty extension cord sparked and arced, igniting the living room draperies. The boy ran upstairs screaming to awaken the household. His father sent his oldest son outside to get a hose while he poured water on the fire.

When the boy returned with the hose, he opened the patio doors and the fire flashed over a wider area. Upstairs, the mother called the fire department and told the children to put on their coats and get out. The father and oldest boy ran from the living room to escape the intense heat, but those still upstairs were blocked by hot gases rising up the open stairwell. Two 13-year-old boys jumped out a second-story window, but the mother and her two youngest children were overcome and died.

Random thermal energy sources will find it harder to work in an alertly controlled home. Proper thermal energy control, of electrical energy, matches, smoking materials and the like can reduce the probability of an unwanted ignition in your home.

But to think that ignition cannot occur at all would certainly be wishful and foolish.

2. *You can slow fire spread.* All ignitions need combustible material on which to grow. The amount and type of combustible material available will determine the speed and severity of the fire.

Picture, if you will, a fireplace with three large logs on the andirons—no paper, no cardboard, no excelsior. Strike a match and throw it into the fireplace. What happens? The match burns out. The logs will not ignite. A great amount of combustible material is present, but it is in a form that won't readily catch fire.

Now consider the same fireplace filled with sheets of Christmas wrappings, lightly crumpled and stuffed up to the bottom of the chimney. Again strike a match and throw it into the fireplace. What happens? Within 25 to 45 seconds a solid wall of flame will be curling out over the mantel from far less combustible material, but in a fine-burnable-form.

The interior of your home is much like a fireplace. Your home may have the usual

amount of furniture, but few cardboard boxes, little paper, and no cluttered storage. It's clean and orderly. You dispose of unused, unneeded, and unwanted items regularly. Like the fireplace with just logs and no kindling, there will be less readily combustible material, and any fire will have to grow more slowly.

But let's look at another home—one with stored cardboard boxes, plywood paneling in the recreation rooms and halls, and low density fibreboard (compressed excelsior) on the ceilings. In this home filled with readily burnable combustibles such as these, a fire can move from match size to room size within minutes. In that short time, deadly changes in oxygen, carbon dioxide, and carbon monoxide will be made, and thick, choking smoke will be jamming into every portion of the house.

The choice is clearly yours as a homeowner. The more combustible material you remove, the slower the fire must develop. The slower the fire spreads, the longer you have to react, and the less threat to you and your family.

Remember the extension cord igniting the living room draperies. Had those draperies been flameproofed, think of the difference in the outcome of that fatal fire.

3. *You can be alerted.* If you have reduced chances for a fire to start in your home, and if you have made it harder for a fire to spread, it's time to talk about fire warning—what can alert you to a fire?

For years, many devices have been available. But they were expensive and required connection to the electrical system because batteries were not considered fail-safe. Recently, the National Fire Protection Association Committee on Signaling Systems has revised its standard on Household Fire Warning Systems. This new standard permits units powered by batteries if they have a built-in method of alerting the householder when the batteries grow weak or something isn't working properly.

Recently, new ionization type units activated by the smoke that generally precedes the heat of a fire have been approved for home use by both Factory Mutual Laboratories and Underwriters Laboratories. These

units are low cost, relatively easy to install, sensitive, and reliable.

According to the standard, the basic detector should be placed between your bedroom sleeping area and the rest of your house. The purpose is to provide a defense against fire in another portion of the house while occupants are asleep in the bedrooms. Additional smoke detectors can be placed in other areas of the house for even earlier warning. One detector on each floor near the main exit route is recommended.

In homes with two or more bedroom areas, a basic detector should be located outside each bedroom area. A detector in the bedroom itself would be a wise investment if there is a special need, such as a young child, an invalid, or a bedtime smoker.

Although your nose is a more sensitive smoke detection instrument than any mechanical gadget, when you're asleep the smoke detector on the ceiling will sense the fire long before your nose on the mattress will. Furthermore, while people sleep their smoke detection apparatus is submerged between several layers of sleep-induced insensitivity. Alcohol and drugs increase this insensitivity.

To add extra escape time to a warning from a basic smoke detector, all bedroom doors should be closed.

4. *You can get out.* If, in spite of everything you have done, a fire should start in the normal exit route, it is essential to have an alternate means of escape from each bedroom. This secondary escape route should not use the central hall or stairway.

In a single level dwelling, where the windows are properly designed and low enough, escape is usually no problem. In two-story houses, bedroom windows on the second floor often open onto a porch roof or deck where rescue can be awaited in fresh, oxygen laden air.

Upper floor windows without a porch roof will require an escape ladder. Because these secondary exits usually present a number of unexpected problems, exit drills should be conducted in your home by every member of your family. The nation-wide program, "Operation EDITH" (Exit Drills in the Home), is a good method for annual trial of your

program. Your drills should be practiced until each person is capable of using their own secondary exit adequately.

5. *You can extinguish a small fire.* Important breakthroughs in light-weight extinguishers for household use have recently been made. For instance, a unit with 10 pounds of chemical, weighing less than 14 lbs. total, is available with a high-powered 4-A 40 BC rating. This extinguisher has more attack power in 20 seconds than a 1943 fire engine with five men had in two minutes.

The agent which extinguishes the flames of a fire on contact is a fine powder that will not harm furniture, electrical equipment, art objects, or rugs. It will extinguish wood, paper, cotton, gasoline, grease, paraffin, or fires in live electrical equipment.

Since escape should be your first consideration in a fire, the extinguisher should be located near an outside door on the first floor of the house. The necessity of going to this first floor exit before returning to the fire assures the availability of an exit at your back. Reaching the extinguisher from the outside with the exit still behind you is also possible.

Always remember that the proper procedure in any fire in your home is to:

1. Get everyone out as soon as possible.
2. Notify the Fire Department—from a neighbor's phone or a fire alarm box.
3. Gather at a family center outside the home to be sure that each person is out.
4. Then, and only then, return to fight the fire if you must.

Compare the following two incidents:

A family of seven was asleep in a one-story home. A daughter who stayed up late to watch television apparently fell asleep while smoking. Her cigarette may have dropped into the sofa, igniting it. The fire quickly spread to wood paneled walls and fibreboard ceiling. The girl awakened her sister, and they were barely able to escape by smashing a louvered window in their bedroom. The

other members of the family,—father, mother, two brothers, and baby sister—were unable to escape and died in the fire.

And the parallel case—a mother entertained guests in the family room after a husband and a daughter had retired. The mother went to bed about 11:30 P.M., and about an hour later her husband was awakened by the alarm from a battery-powered ionization type smoke detector he had recently installed. He found the couch on fire. About three feet of wood paneling behind it was burning, and the flames were licking toward the ceiling. He removed his family, called the fire department, and controlled the fire with a home fire extinguisher. The fire department completed extinguishment. Result—no injuries or loss of life.

Summary

Fire is a physical and chemical phenomenon. It can be kept from starting by good control of heat sources in your home. It can be kept from spreading by keeping kindling combustibles out of your house. When you are asleep at night, you can know that a fire exists through proper use of the newly available smoke detectors. On being alerted you can have safe, alternate rapid methods of leaving the home and, finally, you can have strong, powerful firefighting equipment readily available in your home.

It is time to publicize a National Home Fire Management Program. I solicit support from the National Safety Council, the members of the Society of Fire Protection Engineers, the National Fire Protection Association, and those members in the federal government charged with responsibility for home fire safety. We can dramatically reduce the number of fires, the number of people burned, and the number of people killed in home fires this next year through an active implementation of the principles of managing a fire-safe home.

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March 21, 2001

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