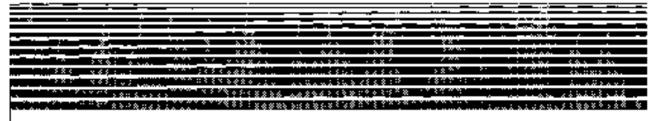
U.S. Fire Administration



Technical Report Series

Four House Fires That Killed 28 Children



Four House Fires That Killed 28 Children

Milwaukee, Wisconsin September 30, 1987 10 Children,

2 Adults

Milwaukee, Wisconsin October 15, 1987 6 Children

Prince Georges County, Maryland November 26, 1987 6 Children

Pleasantville, Ohio December 18, 1987 6 Children

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Four House Fires That Killed 28 Children

Summary

In the last quarter of 1987, four fires in three communities killed 28 children and two adults. Each fire shocked its community. The basic lessons were similar, and common to many other fires:

- There were no working smoke detectors.
- The houses were overcrowded at the time of the fire, which hindered escape.
- Wooden, non-compartmented construction allowed rapid fire and smoke spread.
- Lack of escape planning and practice and lack of general fire prevention education characterized most of the victims.

The Summary of Key Issues chart on the following page shows a more detailed comparison of the key aspects of these four fires. Three of the fires exemplify the largest and least easily solved fire safety problem in the United States -- overcrowded homes in poor neighborhoods where the people have had little or no fire safety education and do not maintain smoke detectors. The fourth fire shows it can happen elsewhere, too. Together they represent high hazards that working detectors and escape plans can reduce.

The first fire occurred in Milwaukee on September 30, 1987. The cause of the pre-dawn blaze in the 93-year-old wood frame house has not been determined. The house was not equipped with smoke detectors. A Milwaukee city ordinance requires smoke detectors in all homes built before 1980; occupants were responsible for detector installation in rental properties such as the house in this incident.

Summary of Key Issues

Issues	Milwaukee 1	Milwaukee 2	PG County, MD	Pleasantville, OH
Fatalities	12	9	9	9
Could some have been saved with earlier warning?	Yes	Yes	Yes	Yes
Cause	Accidental but unknown	Misuse of space heater by child	Misuse of matches by child	Unattended cooking
Smoke Detectors	None present	None working (2 present)	None working (1 present)	Not in recommended location
Occupancy	Overcrowded; 15 people present	Marginally overcrowded; 11 people present	Overcrowded; 15 people present	Not crowded
Construction problems	Old, wood construction; open stairway	Old, wood construction; open stairway	Old, wood construction; open stairway	Very old wood construction; open stairway; 7'ceiling in bedroom where deaths occurred
Delayed alarm	Yes	Yes; neighbors attempted rescue	Yes	Yes
Window problems	0 Z	ON	Yes	Yes
Furnishings	High fire load	Ordinary	High fire load	Ordinary
Fire spread	Very rapid	Very rapid	Very rapid	Very rapid
Would escape plan have helped?	Yes	Possibly	Yes	Yes
Would fire prevention education have helped?	Yes	Yes	Yes	Yes

At the time of the fire, the house was occupied by 15 people, five adu 1ts and 10 children, most of whom were related. The main tenant was in the process of getting settled after moving north from southern Florida. Her sisters and brother, and seven of their children, had joined her and her two children in Milwaukee. A friend and another friend's child were also staying there at the time.

The fire killed two of the adults and all 10 children.

Only two weeks later, on October 15, 1987, another Milwaukee fire in a large, 75-year-old wood frame dwelling occurred when a lo-year-old put a blanket over a space heater. Gas service, the main source of heating for the house, had been suspended after bills had gone unpaid. The family had been cautioned twice within a few days of the fire about using electrical appliances such as a toaster oven for heating and about the need to keep combustibles away from space heaters. Although the house apparently was equipped with smoke detectors, batteries had been removed from at least one; it is likely that batteries were dead in the other.

While it was not precisely determined, it is estimated that the house was occupied by 12 to 15 people; 11 people, including a baby-sitter, were in the house at the time of the fire. Ironically, the 38-year-old mother of the occupants had been taken to a hospital two days prior to the fire to give birth to her thirteenth child; a 17-year-old girl had come over to baby-sit while the mother was away.

The fire killed the baby-sitter and five young children.

On November 26, 1987, Thanksgiving Day, an early morning fire in a 50-year-old house in Prince Georges County, Maryland, was set by two children playing with matches. Batteries for the smoke detector in the house had been disconnected.

At the time of the fire, the house was occupied by three generations of a family, 15 people in all. Some had been up all night preparing Thanksgiving dinner. The youngsters who set the fire, ages two and four, woke up before the others, found some matches, and set fire to a child's school bag that was next to a sofa in the living room. Apparently

surprised at how quickly the fire grew, and worried they would be punished, the two retreated to their bedroom and left the fire burning.

The two children had a history of fire-setting. Their grandparents, who headed the household, had warned the other adults in the house that corrective action should be taken or that the consequence might be a serious fire, but no professional counseling had been sought for the children.

The fire killed five children and the baby-sitter, and injured four adults. The youngsters who set the fire were among the survivors.

Another tragic fire occurred in Pleasantville, Ohio, on December 18, 1987. The blaze was caused by an unattended pan on the kitchen stove. A smoke detector was located on the first floor but was not installed in a recommended location. It apparently did not operate, even though it had new batteries and reportedly had been tested only two weeks prior to the fire. Its location may have been a contributing factor. The detector was adjacent to a large stairway opening; smoke was able to leave the kitchen and pass up to the second level without ever reaching the detector.

At the time of the fire the house was occupied by one adult and six children. A woman had taken her three children to her brother's home to baby-sit for his three children. They had left a pot of water heating on the stove while she went up to quiet the children who said they could not go to sleep because they were afraid of 'monsters." She had decided to lie down with them until they fell asleep, but she fell asleep as well, apparently forgetting about the pot on the stove.

The fire killed all six children. Although she was overcome by smoke, the woman survived.

These four fires, with their tragic results, re-emphasize several very important lessons. Chief among them is the importance of public fire education focused on the need for smoke detector maintenance and escape planning and specially targeted to reach high-risk groups such as low-income families and their children.

The majority of these fires involved old, overcrowded houses in primarily low-income neighborhoods. In most cases, the ratio of children to adults was high. This paints a classic picture of high fire risk and includes those who have been traditionially hardest to reach with fire safety information. Communities should increase their efforts to involve these people in fire safety programs.

The warning and extra escape time offered by smoke detectors could have made a difference in the number of lives lost in these fires. Not only the need for detectors but the proper installation and maintenance of them should be a consistent topic of fire safety messages.

There was little evidence in most of these fires that any attention had been given to escape planning or practice. In a home with a large number of occupants, knowing how to get out takes on added importance.

In addition, the escape planning process could have pointed out obstructions in time to eliminate them. In two of the fires, escape was hampered by old, poorly maintained windows that would not remain open by themselves. And in one case, bars installed on windows as a protective measure blocked exit.

That the lessons learned from these fires are not new makes these deaths all the more tragic. What more incentive is needed to step up efforts to end the loss of children to fires?

Milwaukee House Fire Kills Twelve September 30, 1987

Dan J. Carpenter

Report number 1 of 4.

MILWAUKEE HOUSE FIRE KILLS TWELVE

Milwaukee, Wisconsin, September 30, 1987

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OVERVIEW

At approximately 0442 on September 30, 1987, the Milwaukee Fire Department received a public telephone alarm from an unknown person advising the dispatcher of a residential fire at 1738 North 23rd Street. Thus began the most tragic residential house fire in the city's history. The pre-dawn blaze killed 12 people, 10 of whom were children under the age of nine. Three adult occupants escaped unassisted.

SUMMARY OF KEY ISSUES

Issues Comments

Fire Cause	Unknown
Casualties	12 dead, including 10 children. All fatalities from high carbon monoxide level.
Smoke Detectors	None found; occupant was responsible for installing, by local code. Owner claimed he had installed two detectors. Earlier detection probably would have saved lives.
Overcrowding	15 occupants in small single family dwelling, including 10 children. High fire load of possessions.
Structure	Old wooden house, hollow walls. Stairway acted as chimney - fire and smoke spread rapidly.
Human Behavior	Large number of children overwhelmed capacity of adults to help. Adults also did not know sleeping location of all children.

That a total of 15 people occupied the property at the time of the fire points to one of the major reasons why this fire took such a toll and serves as a sad reminder that poverty and overcrowding create an especially dangerous potential for disaster. Moreover, the home had no smoke detectors and a high fire loading in large part due to the bedding, clothes, and other household items of the 15 occupants. An open stairwell to the second floor enabled the fire and smoke to travel unimpeded from the first floor -- trapping the occupants.

Had working smoke detectors been present it is likely that at least some lives would have been saved. Neighbors heard cries for help. Some of the occupants had awakened and succeeded in escaping. The adults and most of the children who died were found in locations other than their beds, indicating that they too had been aroused from sleep and had made an attempt to flee the fire. With more lead time the number of survivors likely would have been greater. The lesson of how critical smoke detectors are to saving lives is taught once again in this fire and in the others discussed later in this report.

BACKGROUND

Three weeks before the fire a city building inspector, responding to complaints from the home's principal tenant, checked conditions and noted over 20 code violations. Most of the violations, however, posed no immediate threat. The inspector also was reported by the local press to have mentioned after the fire that detectors were absent, but that fact was not included in the list of repairs and improvements cited in the inspector's report. Whether the inspector did or did not note the absence of detectors is a subject of controversy. The owner of the building claimed that the house had had two functioning smoke detectors - one upstairs and one downstairs, but evidence of them was not found.

The city ordinance in effect at the time of the fire required smoke detectors in all homes built before 1980; however, occupants were responsible for installing the alarms in rental properties with one or two families. The lack of smoke detectors ended up being far more critical

than damaged ceiling plaster, broken window panes, and missing door knobs
-- items that were included in the inspection report, which focused on
repairs required from the owner.

Crowded into this 93-year-old house at 1738 North 23rd Street on the night of September 29th was an assortment of friends, cousins, and sisters -- some just visiting, others residing there permanently or periodically. The main tenant was a member of a large family that was in the process of getting settled in the north to escape the heat and drugs of her former community in southern Florida. Concern for their children led the tenant's sisters and a brother to join her in Milwaukee. Though she survived, two of her children, seven of her nieces and nephews, and one of her sisters died. A friend of one of the sisters also perished as did the young child of another friend.

When the building inspector last checked the property she observed the crowded conditions. However, there were no codes or city ordinances limiting the number of occupants and therefore no legal basis for objecting to the number of adults and children staying at the house. Also, it was difficult to ascertain how many were permanent residents and how many were simply visiting.

THE FIRE

Shortly before dawn on September 30, an unidentified person notified the Milwaukee Fire Department of the fire. When firefighters arrived three minutes later, the small, 1 l/2 story, wood frame house already was heavily involved and fire was extending to the exposure building on the north side.

According to the Officer-in-Charge, 5th Battalion Chief James Rechlitz, the response of Engine Companies #32, #5, #28, and Ladder Companies #9 and #2 was routine until they arrived to view a "raging fire" that was coming out the first floor windows and had already begun to spread to the adjacent building (1740). Black smoke was coming out of the second floor window on the west side. Flames were also observed spreading under the eaves of the house to the north and through first floor windows. A

special alarm for extra help and manpower was sounded and a total of 40 firefighters including Squad #I, Car #3, and #15 were called to the scene, bringing the fire under control shortly thereafter.

The extent of fire damage was confined to the building of origin in spite of the close proximity (approximately 8 ft.) of adjacent structures. The 20' by 30' structure consisted of a first floor with three rooms and a partially partitioned attic. The interior was extensively burned. The heat of the fire was evidenced on the outside of the building by low heat lines and melted tar and asbestos siding.

Annie Ruth Phillips, the main tenant, was asleep on the first floor when the fire began in the kitchen area. By the time she was aroused, flames blocked a rear window and had burned out the stairway (and only access) to the second floor. "When I pulled the door open, I seen (sic) the fire just shooting up. I was going to get everybody (upstairs). I heard all the kids crying."

Phillips and a male friend, Willie Cross, ran outside where Cross climbed up the roof to an upstairs window in hope of rescuing the 12 occupants who were sleeping on the second floor. A female adult raised the window and Cross pulled her out, but heavy smoke prevented him from entering to save the rest. She jumped to the ground and sustained a crushed vertebrae, two fractured ribs, and a partially collapsed lung. He broke windows with a shovel in an attempt to rescue the other people, but only succeeded in providing the fire with an influx of fresh oxygen. A neighbor tried to help, but he too was beaten back by the heat, flames, and smoke. Firefighters were equally daunted in their efforts to reach the victims.

Firefighters raised a 30 foot ladder to the roof and began ventilation. Meanwhile, engine companies laid two large diameter lines and worked them on the fire building and the exposure building to the north. As the companies made progress, they reduced the lines, donned breathing apparatus, and initiated mop up and overhaul. A lieutenant made his way to the kitchen and closed the oven door of the cooking stove so that he had

room to turn the corner toward the staircase. Finding the staircase burned out, he ordered a 14' ladder brought in and used that to access the second (attic) level and begin searching for occupants.

Meanwhile, another engine and a ladder company were ordered to the exposure building to extinguish the fire, make top side ventilation, and search for occupants. None were found. All residents of that property had escaped uninjured.

One by one the victims from 1738 North 23rd Street were found. Eleven people (nine children and two adults) died on the upstairs level where a number of makeshift sleeping areas had been created. A child, the twelfth victim, was discovered on a bed in a first floor "closet" or small room. Upon discovery, all bodies were moved to the first floor to permit an accurate accounting of the occupants. This action may have contributed to some of the problems later encountered by investigators in determining what actions the victims may have taken to escape. The table presented in Appendix A shows the relationships of the fatalities to the household. Appendix B shows the second-floor plan and locations where fatalities were found.

All the victims died of smoke inhalation, according to the medical examiner. Carbon monoxide levels ranged from 60-90 percent -- much higher than the 45-50 percent considered lethal. All blood-alcohol and drug tests proved negative. The high carbon monoxide levels could indicate that the fire smoldered for some time before gaining sufficient oxygen to burn freely.

While the loss of life in this fire was exceptionally high, the dollar loss was not extraordinary, owing in part to the age and condition of the properties. The main property suffered \$50,000 damage to the home and contents and the exposure building losses were estimated to be \$25,000. But for a low-income family, these nonspectacular amounts can be devastating.

CAUSE

In Milwaukee, the responsibility for determining the cause and origin of a fire of suspicious, undetermined, or incendiary nature rests with the police department. The State's Department of Justice has concurrent jurisdiction and may become involved at their discretion or upon invitation by the police department.

Several days after the fire, investigators tentatively had ruled out heating, electrical problems, and arson as the cause. Carelessness with smoking materials was a possibility but the fire's intensity destroyed most of the evidence, and the real cause may never be established. Newspaper accounts revealed there were smokers in the house and some of them were smoking the night of the fire, possibly while sitting on a sofa which was entirely destroyed. Other reports indicate the fire began in the kitchen area. In any case, it appeared as though some type of careless behavior, rather than electrical or mechanical malfunctions or arson, caused the blaze. The cause was still under investigation at the time of this report.

ANALYSIS OF SIGNIFICANT FACTORS

Many factors contributed to the rapid spread and high death toll of this fire. None of them are new, but rather reflect an all-too-common scenario typical of many low-income, inner-city neighborhoods.

<u>Structure</u> -- The structure was an old (93 years) wood frame building. Constructed before the fire safety features of current codes were on the books, the property had hollow walls that helped the fire spread. The stairway acted as a chimney for the rising heat and smoke.

Overcrowding -- The large number of occupants led to the house having a great deal of furniture, clothing, bedding, and other items that added to the fuel load. Overcrowding also taxed the available exits and, of course, heightened the tragedy with greater loss of life.

<u>Smoke Detectors</u> -- The fire spread rapidly before the first floor occupants awoke and became aware of the danger. The people on the second floor apparently had even less time to respond. Whether more people would

have survived had working smoke detectors been in place can only be surmised, but it seems likely. With a fire discovered in the incipient stage, rescuers would not have been confronted with the heavy clouds of smoke and the intense heat and flames. Perhaps at least some of the children could have been saved.

Also at issue is the question of who should have been responsible for installing and maintaining smoke detectors in the rental property.

The landlord said he had installed a detector on each floor, even though by Milwaukee code it was the occupant's responsibility to install and maintain the detectors. No detectors were found. After the fire, an ordinance was proposed making installation the responsibility of the occupants.

Even if landlords install detectors, all too often occupants neglect or disable the units. New codes alone may not solve this problem; it requires public education as well, especially for high risk populations.

Escape Routes -- The escape routes available to the second floor occupants were no more nor fewer than in most single family dwellings of comparable size. As a 1 l/2 story home it would not be expected to have a fire escape. There were windows in the front and the back of the upper level and a staircase leading down to the first floor. The victims were prevented from escaping not so much because of inadequate exits, but because the rear exits (stairway and window) were too heavily involved, the occupants did not have enough warning to escape earlier, and because most of the victims were very young and needed more training or more help from adults to escape.

Human Behavior -- When the lower-level windows were broken by an occupant's shovel to help others escape, the fire received a fresh supply of oxygen. Also, had the people on the first floor thought about (or known?) a child was sleeping in the closet right by the front door, they might have been able to grab him as they hastily exited the house. The woman with serious injuries who had escaped from the second floor window

originally had a baby in her arms, but then put him back, perhaps thinking that the fall was more perilous than the fire, or perhaps being too panicked to think rationally.

Exposures -- The proximity and similar type of construction of the adjacent property facilitated the fire's spread to that home. The Fire Department's quick response prevented the fire from extending even further in the exposure property and down the block to other nearby, closely-spaced dwellings.

LESSONS LEARNED

In this fire there were no new lessons learned, but several longstanding ones were confirmed. Once again it was shown that poverty, overcrowding, old housing stock, and lack of smoke detectors can add up to a fire disaster.

1. Fire departments need to focus public education on the need for smoke detectors, especially in those areas with the highest fire rates and the lowest coverage of detectors.

The public -- whether owning or renting the property where they live -- must understand how extremely important it is to have and maintain detectors, and how to obtain them if they cannot be afforded. This requires understanding of how fast a fire can grow, and the danger of smoke inhalation. Milwaukee is examining how they can reach more homes by a combination of regulatory means, public education, and smoke detector give-away programs, as have been used successfully by other cities.

2. <u>Fire departments need to emphasize escape planning in low-income areas.</u>

Knowing two ways out needs to be taught to adults and children, especially where overcrowding in combustible old houses exists. Adults need to know where children are sleeping and to practice helping children escape from windows. Adults and children need to understand that a drop from a second story window is not as risky as staying in a smoky fire.

3. <u>City management, not fire departments, must be the ones to address the underlying issues of poverty and overcrowding.</u>

The issues of poverty and resultant overcrowding are complex and do not lend themselves to immediate solutions. Even where codes establish limits concerning the number of occupants allowed in a house or housing unit, the code is difficult to enforce. Who is a permanent resident and who is just visiting? Local governments or landlords who do insist on regulating occupancy levels invite bad press and run the risk of adding to the problem of homeless people. Often when people are forced to leave they just move on to the home of another relative or friend so that the new property then joins the ranks of overcrowded units. Resources beyond the scope of the fire service are needed to solve this problem.

Appendices

- A. Fatalities in First Milwaukee House Fire
- B. Second-Floor Plan and Location of Fatalities
- C. List of Slides Followed by Selected Photos and a Diagram Showing Where Slides Were Taken. (Slides are included with the master report at the U. S. Fire Administration.)

Fatalities in First Milwaukee House Fire

Female, age 29, and her four children:

Boy, 5

Girl, 4

Girl, 2

Boy, 11 months

Children of principal female tenant:

Girl, 8

Girl, 7

Children of another female tenant:

Girl, 5

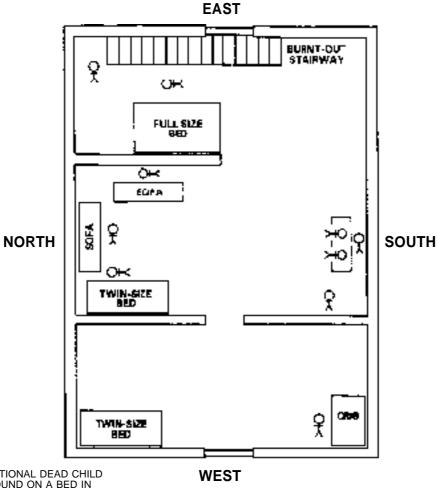
Girl, 4

BOY, 3

Visitors:

Boy, 2

Adult male, 41



ONE ADDITIONAL DEAD CHILD WAS FOUND ON A BED IN A FIRST-FLOOR CLOSET

> SECOND-FLOOR PLAN (Partitioned Attic) 20' BY 30' STRUCTURE 1738 NORTH 23rd ST. MILWAUKEE, WISCONSIN

> > 772-12-19-88-2

List of Slides

The complete set of slides is included with the master report at the U.S. Fire Administration. Enlarged reproductions of the four slides asterisked below appear on the following pages.

Slide No.

- 2. South side of fired building looking towards rear, shows where heavy smoke and heat had escaped after windows were broken out.
- *3. Southeast corner rear shows where fire burned through at end of roof and also where fire department had vented the roof.
- 4. East end of fired building. Debris removed by firefighters.
- 5. Area where fire had vented itself above inside stairwell, indicating extensive heat buildup.
- 6. South side exposure of building on north side of fired building showing close proximity and fire spread to adjacent building.
- 7. North side of fired building shows extensive smoke and heat emission.
- *8. Attic window and corner of front porch on west side of building where escape was made.
- 9. North side of fired building looking from front to rear. Area shown is where tar had run down side of building as a result of heat in this area.
- *10. Fence rail between fired buildings and exposure indicating extensive heat on first floor level.
 - 11. Exposure building (1740) indicates sufficient heat to begin to melt tar behind asbestos shingles.
 - 12. Northeast corner of roof area of fired building looking west, shows extensive heat buildup on this side of building.
 - 13. North side of fired building shows close proximity to exposure and extensive heat at lower level.
 - 14. Rear window on east end of building above inside stairwell where fire had gained access to attic area.

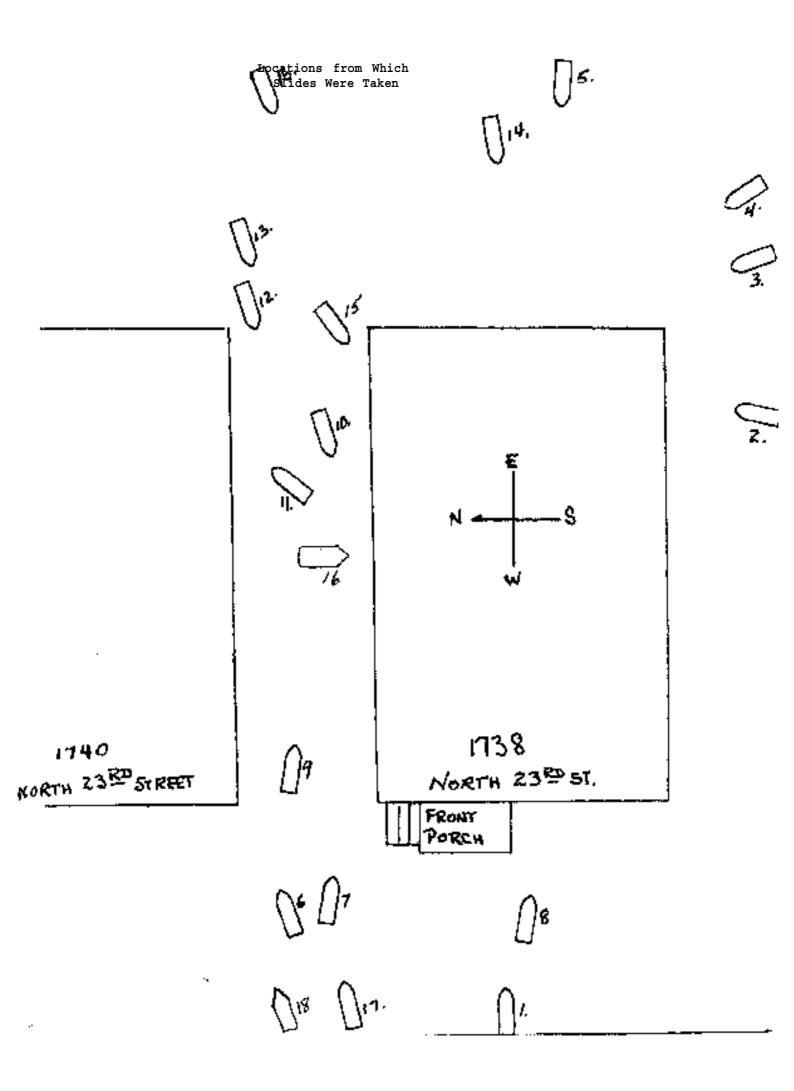
- 15. Low burn area indicates extensive heat at floor level, sufficient to melt tar.
- 16. Debris on northeast end of fired building reflects extensiveness of interior fire.
- *17. Front view of fired building (looking east) on right and exposure on left. Note where fire had already gained sufficient headway to burn through roof. Also note the closeness of the houses.











Second Milwaukee Fire Kills Six October 15, 1987

Dan J. Carpenter

Report number 2 of 4.

SECOND MILWAUKEE HOUSE FIRE KILLS SIX

Milwaukee, Wisconsin, October 15, 1987

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OVERVIEW

Only two weeks and one day after the previously described fire on Milwaukee's north side that took the lives of 12 victims, six more people, all children, lost their lives in a fire one mile away. This second innercity fire occurred on October 15, 1987, at 2045 N. 32nd Street. It was called in by an unidentified female at 0152.

Firefighting efforts brought the fire under control shortly after entry on the first floor, but firefighters once again were confronted with the realization that their rescue attempts were in vain. There were no survivors after arrival of the Fire Department.

While it has not been precisely determined, between 12 and 15 people are thought to have been occupying this house; 11 were home at the time of the fire. Of the five occupants who escaped the fire prior to the arrival of the Fire Department, three were hospitalized for cuts and held for observation. Five of the fatalities were located in second floor bedrooms, and a one-year-old girl was located on the stairs between the first and second floors, under debris. The table presented in Appendix D shows the relationships among the fatalities.

Once again, children were the primary victims, an old wooden structure was involved, the occupancy level was high, and there were no working smoke detectors.

SUMMARY OF KEY ISSUES

Issues Comments

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Fire Cause	Children misusing flammables near space heater.
Casualties	Six dead; five children plus 17-year-old baby-sitter.
Fire Origin	Fire started on first floor, cutting off stairway exit from second floor before occupants were alerted to the fire.
Delayed Report	Fire Department contact may have been delayed while neighbors unsuccessfully attempted rescue.
Structure	Old wooden house with no fire breaks in walls and open stairway allowed fire and smoke to spread rapidly.
Smoke Detectors	Smoke detectors were present but not operational; at least one was intentionally disabled.
Exposure	Closely-spaced old wooden houses allowed quick spread.
Firefighting Operations	Conditions untenable on arrival; rescue not possible for any who were not already out. Quick action limited further spread.
Human Behavior	Lack of detector maintenance. Lack of escape planning. Lack of prevention knowledge by children.
Disconnected Gas Service	Gas service disconnected because tenant failed to pay heating bills and failed to provide information required by gas company to get assistance.
	Family resorted to alternative heating that was ignition source.

BACKGROUND

Two days before five of her children were to perish in an early morning blaze, a 38-year-old mother of twelve and grandmother of five was taken by paramedics to Mt. Sinai Medical Center to give birth to her thirteenth child. A 17-year-old girl came over to stay at the house and baby-sit the children. Ironically, one of the paramedics who came to help the mother to the hospital when labor began noticed space heaters and warned the family to keep them away from combustibles. "I'd hate to hear about you on the news," he said.

Several nights before the fire the landlord visited the house and also cautioned the family about fire safety. He saw that they were using electrical appliances for heating and warned the oldest boy about warming the kitchen with a toaster oven. It was the responsibility of the tenants to pay for heat but not electricity. The family had lived at the property only six months, but had resided in other properties owned by the landlord, who knew the family fairly well. On several occasions he had forgiven their rent, provided groceries to them, and given a job to one of the sons.

Because the 6-bedroom, 2-bath property was built in 1912, it did not meet current code standards as applied to newer housing. However, there were no code violations outstanding and the house was in good repair. The electrical system recently had been upgraded, the gas heating unit was still within its expected life cycle, and the landlord had completed carpentry, tiling, and painting work not too long before.

Even though the heating system was functional, it was not in use on the night of the fire. Four months earlier in May, the Wisconsin Gas Company had disconnected gas service to the house after sending two notices warning the occupants of the consequences unless the gas bill was paid. On September 15, the company discovered that the outside gas meter had been tampered with, thus restoring service, illegally, to the home. Two days later service again was shut off and the utility installed a tamper-proof meter.

On October 8 and 12, one of the older sons personally called on the customer service office of the gas company to ask that service be restored and that the account be registered in his name, rather than his mother's. But since he could not provide positive identification nor prove that his mother no longer lived at that address, gas company employees declined to act on his request. A gas company administrative ruling prohibits resumption of service if the delinquent customer still resides at the billing address.

The nights began to get chilly and the family resorted to electric space heaters and other appliances to ward off the cold. There was a special concern for heat because three of the children were under two years of age and the 16-year-old girl was pregnant. These were the conditions the night of October 15.

THE FIRE

Sometime after retiring for the night, one of the children, a lo-year-old boy, became sweaty from the heat produced by an electric space heater. He threw a blanket over it to stop it from putting out so much heat. Later he saw the couch on fire and flames licking the curtains. He tried to put out the fire with a cup of water, then fled the house. Meanwhile, the 19-year-old son ran through the house frantically trying to awaken the babysitter and his sisters and brothers and help them escape. His pregnant 16-year-old sister and her 9-month-old child escaped from a window on the second floor by jumping to the ground. A witness saw her drop the baby to the ground, then jump out herself, followed by the older brother. The 12-year-old sister also escaped with only minor injuries. This occurred before firefighters arrived; the rest of the occupants, including the babysitter and five other children, perished.

As they escaped the burning house, the survivors ran to neighbors' homes screaming for help. The older brother shouted to neighbors to douse him with water so he could attempt re-entry. They poured water on him but he could not get back into the house. A man tried to enter the back of the house by breaking windows, but, according to a neighbor, "the fire kept

blowing him back." A woman and two other men from the neighborhood also tried to get in. "You could feel the heat from across the street," the woman was quoted as saying. Placing a bench at the back of the house they attempted to climb up to the second floor. One of the men succeeded in entering but then was driven back by the heat. Most of this activity apparently occurred before the Fire Department was contacted.

The Fire Department switchboard received the first call at 0152. Firefighters from a station five blocks from the burning home arrived at the scene within four minutes. Battalion Chief Howard Glassel along with Engine Company #32 and Ladder #9 arrived to find the home fully involved with flames showing in all front windows and the attic. A captain from the ladder company said of conditions when he arrived, "Superman couldn't have gotten in there without melting." A lieutenant claimed that from the fire station five blocks away, "it looked like high noon . . we could see the glow..." Fire already had spread to the adjacent property at 2041 North 32nd Street, where all nine occupants got out safely.

Engine Company #32 laid a 2 1/2" line and knockdown lines to the southeast corner of the building and a 3" line and knockdown lines to the northeast corner to attack the fired building and protect exposures. The rear entrance on the first floor was covered with a 1 3/4" attack line to extinguish flames and facilitate search and rescue. That line then was advanced to the second floor via the interior stairway. Ladder Company #9 advanced the 3" line to the rear and raised a portable ladder to the second floor porch, reduced the line, and advanced into the second floor.

Meanwhile, Engine #5 was directed to lay a 2 1/2" line off Engine #32 and to work alternatively on the north and south sides. They laddered to the attic window, reduced the line, and assisted in second floor search and rescue operations. Ladder #13 worked on ventilating the southern exposed building. As victims were found, fire personnel stood by the areas of discovery while police officials and the Medical Examiner conducted their preliminary investigation.

A total of more than 40 firefighters responded to the fire. Six engines, two ladder trucks, two medical units, and a mobile hospital unit were dispatched. The fire was under control in an hour.

CAUSE

A week after the fire, officials confirmed that evidence pointed toward the living room space heater as causing the fire. The family's I0-year-old son admitted to investigators that he placed a blanket on or next to the space heater because he was too hot. And it was at that location that the same child later found flames engulfing the couch and curtains. During overhaul, investigators found three space heaters, two on the first floor and one on the second level.

Sadly, the family would not have had to use space heaters had they applied for help from a fuel assistance program established to help low-income families meet fuel bill payments during the heating season. They qualified for the assistance.

ANALYSIS OF SIGNIFICANT FACTORS

Many of the circumstances surrounding this second high-fatality fire in Milwaukee are similar to those of the first fire.

Structure -- The property was an old (75 years), highly flammable house constructed before fire breaks in walls and other fire protection building features were required. These factors contributed to the rapid spread and the intensity of the fire, which considerably reduced the time for escape. Adding to the problem was the open stairway that quickly ushered the smoke and heat upstairs where most of the occupants were sleeping.

Smoke Detectors -- Though investigators found no smoke detectors, the landlord claimed and an occupant confirmed that two were installed: one above the stairway and another in the kitchen. The older son admitted to having removed the batteries in at least one. He did not recall hearing the other detector sound the night of the fire. Possibly the battery in that detector had been allowed to go dead, or another family member may have removed that battery, too. In any case, the issue in this fire was not a failure to install the hardware, but, tragically, the intentional disabling of one detector and the possible failure to maintain another.

Exposure -- As with the first fire, the neighborhood of the second fire featured closely-spaced houses that heightened the risk of exposure fires. Again, the Fire Department's actions held the spread to that which was present when they arrived.

Overcrowding -- In this second fire it is questionable as to whether one can say there was overcrowding. Certainly the house was fully occupied, but unlike the property in the first fire where 15 people were crowded into a small, 1 1/2 story home with only two bedrooms, this home was 2 1/2 stories and had six bedrooms to accommodate the eleven people sleeping there the night of the fire. What can be noted is that large families living in fire-prone dwellings clearly stand to suffer a greater loss of life.

Fire Origin -- Both this fire and the previous fire originated on the first floor and cut off the stairway exit for second floor occupants, who were left with only the windows as an escape route. While the windows were a viable option, there was not enough time for most of the occupants to use them. Also, many of the victims were young and may not have realized they could get out the window or may not have been able to do so alone.

<u>Human Behavior</u> -- Of all the factors affecting this fire, the most significant was human behavior. Had the smoke detector battery not been removed and/or the other detector properly maintained; had a blanket not been placed too close to the space heater; or had the family been informed and taken advantage of a fuel assistance program, this fire could have been prevented or, at a minimum, the death toll lowered.

A separate factor in this fire concerns the utility. Few people would argue that a gas company is obliged to provide gas service free (in fact, their inability to collect on past due accounts at this property meant they had provided free service for a while; and they did follow proper notification procedures before cutting off service). Moreover, based on a staff report from the Public Service Commission of Wisconsin on the investigation of the events surrounding this fire, it is evident that the gas company carried out a comprehensive effort to inform the occupants of pending service cutoff, the requirements for getting service restored, and the procedures for obtaining fuel assistance grants. The report

recommended that the utilities "include warnings about the dangers of space heaters" in the utility safety information programs.

LESSONS LEARNED

1. A tragedy -- or multiple tragedies -- can be used to overcome apathy, raise awareness, and stimulate citizens to take fire safety actions.

If the first fire that claimed 12 lives was not enough of an incentive, the second fire within two weeks which claimed yet another six lives spurred the neighborhood and City Council to action.

Neighbors as well as residents in other areas of the city voluntarily began stocking up on smoke detectors. Meetings were held to review the tragedies and to seek ways to avoid recurrences. City aldermen quickly passed an amendment to the smoke detector ordinance changing the responsible party for detector installation from the occupant to the landlord in single and two-family rental units. (Landlords already were responsible for detectors in units with more than two families.) Landlords also must now provide batteries with every change in tenant and annually when leases are renewed. Occupants must supply batteries at other times.

2. Special efforts must be made to target fire prevention education programs to high-risk areas -- especially on smoke detectors and escape plans.

The combination of poverty, combustible construction, and crowding creates a high risk for serious fires. Most fire departments throughout the nation have an area or group of neighborhoods in their community where a disproportionate number of fires occur. Even the most austere budget must make room to fund educational outreach to those at greatest risk.

3. The fire department must act to help firefighters cope with the trauma of multiple fire deaths.

The impact on family and friends of those who died in this fire and the first Milwaukee fire was keenly felt by the community, but also the firefighters. When two such horrible fires occur back-to-back and some of the same firefighters respond to both, psychological trauma should be expected and mitigated.

The personnel from Engine #32 had the difficult job of, not once but twice in a span of two weeks, discovering and helping to remove the bodies of young children. These men reported feeling "numb" and "helpless." Programs to assist firefighters to recover from such shocking situations should be investigated beforehand so departments are prepared to lend assistance or refer individuals to appropriate counseling programs.

4. The use of alternative heating is one of the leading causes of fires in residences and requires special attention, especially in low-income neighborhoods.

Alternative heating sources used by low income families are often highly dangerous -- dangerous because they may be misused, because the danger is not apparent, and because the appliances may be old and in disrepair.

Education efforts need to be focused on this particular problem, especially in the early fall before the heating season starts.

5. <u>Multiple city agencies/departments need to work at the root causes</u> of fire.

Perhaps the hardest lesson of all learned from these fires is that real and permanent solutions require far more than smoke detector programs and talks on how to prevent fires and escape from them. As necessary as those are, it becomes evident after a series fires like those described in this report, that preventing fires touches more agencies of local government than the fire department alone. Attempts at solutions need to include those agencies handling housing, utilities, code enforcement, planning and development, taxes, welfare and human services, and police.

Appendices

- D. Fatalities in the Second Milwaukee House Fire
- E. Plan of Second Floor Showing Location of Fatalities
- F. List of Photographs, with a Diagram Showing Where Slides Were Taken.
- G. List of Slides Followed by Selected Photos and a Diagram Showing Where Slides Were Taken (Slides are included with the master report at the U. S. Fire Administration.)

Fatalities in Second Milwaukee House Fire

Babysitter:

Girl, 17

Children of one mother:

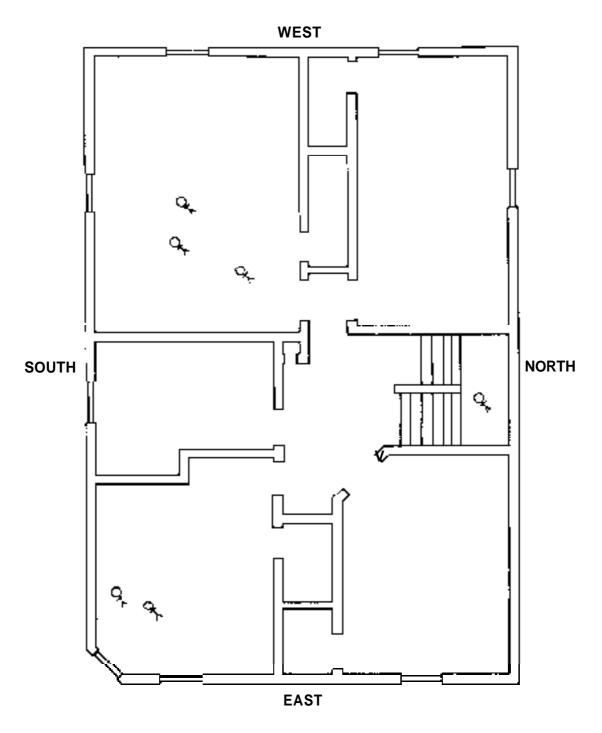
Girl, 13

Girl, 11

Girl, 8

Boy, 2

Boy, 1



SECOND-FLOOR PLAN 36' BY 23'6" 2045 N. 32nd ST. MILWAUKEE, WISCONSIN

List of Slides

The complete set of slides is included with the master report at the U.S. Fire Administration. Enlarged reproductions of the six slides asterisked below appear on the following pages.

- *18. Front view of fired building looking west. Note close proximity of adjacent buildings (approximately 3-4 feet).
 - 19. Close-up of north side front porch roof, showing heavy burn marks and smoke stains over lower and upper floor windows.
 - 20. Close-up of south side of front porch roof shows extensive burn. This suggests that flames apparently came from a door or window left open after the fire started.
- 21. Exposure to the north of fired building indicates sufficient heat buildup to begin to melt tar from shingles at upper level.
- *22. Rear porch area on west end of fired building shows light smoke stains while window on right shows heavier smoke.
- 23. Heavy smoke and charring on first floor window in rear.
- 24. Close-up of rear view of fired building and exposure shows heat at upper level of exposed building on south side of fired building.
- 25. Close-up of north side of fired building shows the close proximity of adjacent structures and probability of fire spread.
- 26. Lower door at north end of fired building indicates extensive smoke buildup, even below the area where the fire is believed to have started.
- 27. View of north side of fired building toward window on second floor shows extensive smoke with only slight smoke from lower windows.
- *28. Front porch rail on east side of fired building shows extensive heat patterns and aligatoring at first floor level again indicating that front door was probably left open and windows broken.
- 29. Underexposure.
- 30. Front of fired building directly over front porch shows extensive charring on porch roof, windows on second floor and roof of building.
- *31. Distance shot shows where greatest concentration of heat and smoke buildup at second floor level was in front and center of building over open stairwell.

- 32. Same view as #31.
- 33. Front of fired building.
- *34. Same as #33.
- 35. Southeast corner of 32nd and Brown gives pictorial view of neighborhood and type of houses common to this area.
- *36. Southwest corner of 32nd and Brown gives pictorial view of neighborhood and type of houses common to this area.



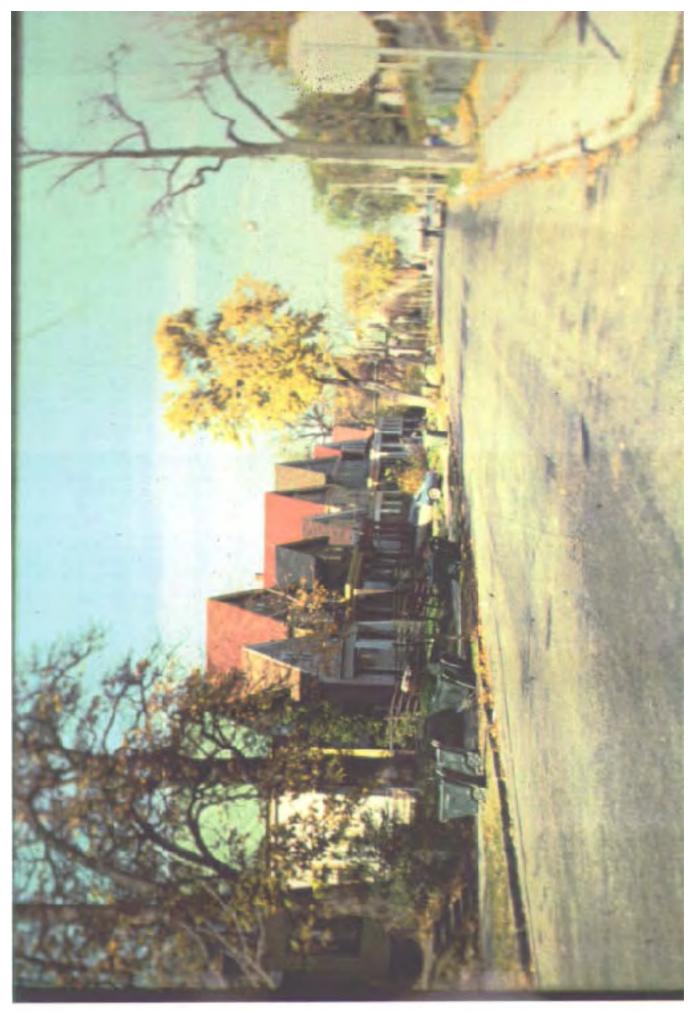


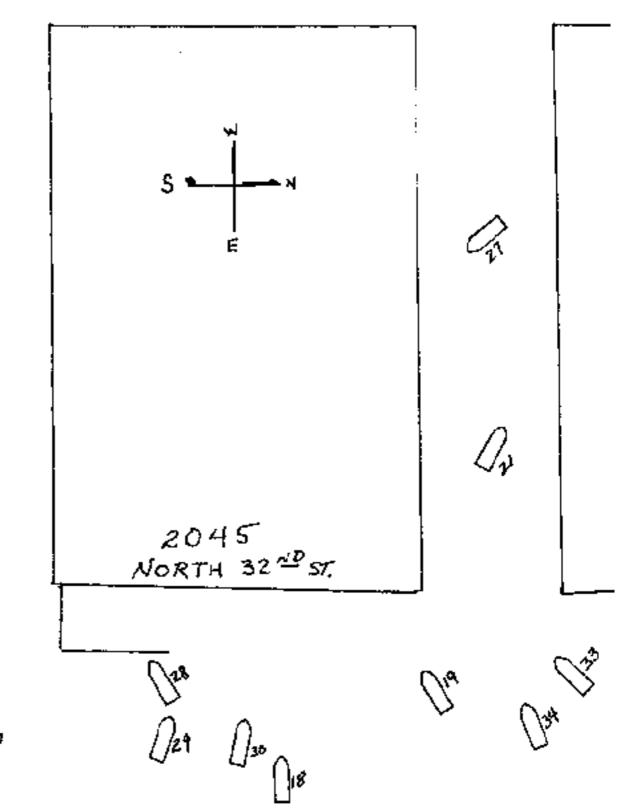












Six Children Die in House Fire Prince George's County, Maryland November 26, 1987

Jeffrey M. Shapiro, P.E.

Report number 3 of 4.

SIX CHILDREN DIE IN HOUSE FIRE

Prince George's County, Maryland November 26, 1987

Investigated by: Jeffrey M. Shapiro, P.E.

Local Contacts: Chief M. H. Estepp

Captain Danny Jarboe

Prince George's County Fire Department

6820 Webster Street Landover Hills, Maryland

(301) 772-9080

OVERVIEW

A smoke detector located only a few feet from the area of origin had an empty space where the battery belonged. Two children with a history of fire-setting had gone without professional counseling. Such were the ingredients that resulted in the deaths of six children and the injury of four adults in an early morning fire in Prince George's County, Maryland, on Thanksgiving weekend in 1987. Even with a progressive and long-standing county program in fire prevention and fire safety education, the message did not reach the family who sacrificed nearly an entire generation to this fire. An overcrowded house and a window that would not stay open added to the difficulties of escaping.

BACKGROUND

Prince George's County, Maryland, is a large county in suburban Washington, D. C. with a population of 675,000 and covering approximately 500 square miles. The town of Seat Pleasant, where the fire occurred, is located within the county just outside of Washington. Seat Pleasant is primarily a residential community with a high percentage of low- and middle-income families. Fire protection and emergency medical services are provided by the county Fire Department. It coordinates County-operated facilities and local volunteer companies, and provides fire prevention,

SUMMARY OF KEY ISSUES

Issues Comments

Fire Cause	Juvenile fire-setting.
Delayed Report	Occurred in early morning while occupants slept; lack of immediate reporting by neighbors.
Structure	Single-family residence. Two-story wood frame. Lightweight construction of porch contributed to quick spread.
Smoke Detectors	Batteries removed from smoke detectors.
Overcrowding	Fifteen occupants were sleeping in the home at the time of the fire.
Human Behavior	Juveniles had history of playing with matches. Occupants apparently had little fire safety education despite strong county education program.
Windows	Bedroom window would not stay up by itself; contributed to loss of three children in the room.
Fire Investigation and Follow-Up	Prince George's County Fire Department made an extraordinary effort to investigate the cause of the fire and sensitively break the news to the community. Aunt of children used as intermediary in interrogation.

fire investigation, and other central services to the entire county. The town of Seat Pleasant is protected by a volunteer department supplemented by paid county firefighters.

The house where the fire occurred (Figure 1 in Appendix H) was more than 50 years old and of wood frame construction.

The house was divided into two levels, of approximately 960 square feet each, connected by an open stairway. It had six bedrooms, two on the first floor and four on the second. Residing there were three generations of a family, and a friend. (A photograph location key and floor plan are shown in Figures 2 and 3.)

On the night of the fire, there were 15 occupants, ranging from less than 1 year to 51 years of age. Fourteen of the 15 normally resided in the house, which could be considered overcrowded. A family tree and occupant code numbers used for purposes of this report are shown in Figure 4.

Previous episodes of juvenile fire-setting had occurred. Two youngsters, ages two and four, had been caught playing with matches on at least two previous occasions. In one instance, the children set fire to a bed; in the other, a teddy bear was burned. Clearly, a problem existed.

The remedial action taken by the grandparents, who owned the house, was to call the adults together and tell them that the match play must stop or somebody was going to burn the house down. There was sensitivity to the problem, but professional help was not sought. Unfortunately, a smoke detector in the living room on the first floor with a disconnected battery was the family's first line of defense.

THE FIRE

On the morning of November 22, just before 0800 hours, the 15 occupants had all finally gone to bed, some after being up all night preparing Thanksgiving dinner. Two of the children, brothers aged two and four (occupants number 2 and 3, respectively), awakened before anyone else and went into the living room to play, where the grandmother was sleeping on the sofa. The two children apparently found a pack of matches behind

the sofa and proceeded to ignite a children's school bag that was adjacent to the sofa. The area of origin was an area where the children normally played.

Apparently surprised by how rapidly the fire grew and worried that they would be punished if caught, the children retreated to their first floor bedroom and left the fire burning. Remains of the area of origin are shown in Figure 5. Figure 6 shows the locations of occupants, the fire size, and smoke spread at this time.

Shortly thereafter, the grandmother--awakened by the fire--apparently attempted to put the fire out by beating it with her bathrobe. Unable to extinguish the flames and with fire continuing to grow, she left the house using the front door, leaving it open behind her. This additional ventilation is likely to have contributed to the speed of fire growth.

The inoperative smoke detector was located on the ceiling of the living room immediately adjacent to the area of origin. It most likely would have alarmed at this time if it were working. From the outside, the grandmother began to scream to the occupants to get out and get the babies out. Figure 7 shows the locations of occupants, the continued growth of the fire, and smoke spread.

The first extension of the fire occurred after the living room window vented and allowed the fire to spread into the porch area under the porch roof (see Figure 8). Driven by the wind, the fire quickly penetrated the lightweight soffit (see Figures 9 and 10) and entered the second floor bedroom directly above the living room, where occupants 6, 7, 8, and 9 were sleeping. Two of these occupants were twins seven months of age; the other two were 10 and 23 years old.

The first occupant in this room to detect the fire was the 23-year-old daughter (#9), who rolled out of bed onto the floor and raised the window (see Figure 11). Shortly thereafter, the lo-year-old son (#8) awakened in the same bed, sat upright, apparently was overcome by superheated gases, and fell back into bed. By now, the fire had progressed to such a level that the smoke in the second-floor bedroom had banked down to approximately

three feet off the floor, and it is likely that the three children in this room could not have been saved. The grandmother had been going around the house clockwise from the front door, saw her daughter (#9) at the window, and told her to jump, which she did--head first. (She survived.)

Meanwhile, one of the 4-year-old grandsons (#4) had been awakened in the first floor bedroom and attempted to exit from the front door (see Figure 12), but was driven back by fire and exited via the bedroom window. A 21-year-old son (#5) had also been awakened in the other first floor bedroom, become aware of the fire, and attempted to exit. After checking the bedroom door and determining exit through the house to be impossible, he closed the door and passed the twin grandsons, occupants 2 and 3, through the window before exiting himself. The door to this bedroom was normally kept open, but when the 21-year-old son awakened, the door had already been closed. It is thought likely that when the children ran back into the room after lighting the fire, they closed the door to separate themselves from the fire.

Shortly thereafter, the 5-year-old grandson (#15) who was sleeping in his own bedroom detected the fire and went to his mother and father's room (occupants 11 and 12, respectively). He banged on the door, went into his parents' room, and climbed into bed with his parents and two siblings, apparently too scared to tell them about the smoke. The parents were apparently still unaware of the fire. This family of five, located in the bedroom directly above the kitchen, were now the only occupants still alive in the building besides the 41-year-old visiting family friend.

Shortly, the family friend (occupant 10) detected the fire, attempted to exit through the hallway and retreated to exit from the bedroom window.

Cumulative progress of the fire is shown in Figure 13.

The first adult in the other room to become aware of the fire was the mother, who grabbed one of her children by the hand and pulled him/her to the window. The mother needed two hands to open the window, and when she reached back to grab the child, she was unable to hold the window in the

raised position and hold the child, who reportedly fought her. As the heat became unbearable, the mother was unable to continue rescue efforts and went out the window by herself. Directly behind her came her husband. He had looked out the window, saw his wife and several children on the ground level, assumed the children were his own, and climbed out. In an effort to save the children, the 21-year-old son (occupant 5) re-entered the house through the rear stairway (Figure 14) and made his way into the second floor hallway (Figure 15).

Cumulative progress of the fire is shown in Figure 16.

By this time, the fire had progressed such that the heat and smoke were unbearable. The 21-year-old son was unable to make entry into the bedroom and left the second floor through a rear doorway from the second floor (Figure 17). Figure 18 shows the progress of the fire just before the arrival of the Fire Department and the locations of the six fatalities.

FIRE DEPARTMENT ACTIONS

The Fire Department received an initial call reporting the fire at 203 69th Street with people trapped, which had been radioed in by a police officer. The police officer had been driving in the area, noticed the smoke coming from the vicinity of 69th Street, and then located the fire. This means there was a significantly delayed alarm; by the time the alarm was turned in, the house's interior would have been fairly well involved.

Before the police officer called in the alarm, two neighbors had also become aware of the fire. However, neither called the Fire Department. One did not have a telephone, and the other ran directly to the house to help without calling the Fire Department. Only one neighbor called the Fire Department, and that was after the police officer had called in the alarm. (People sometimes assume others have reported a noticeable fire.)

The nearest fire station was only three blocks away. It was a volunteer station with a career driver. Several volunteers were in the station when the call came in, and an engine and squad responded with full manning within three minutes after initial receipt of the alarm at 0807.

The first units arrived on the scene at 0808 and quickly extinguished the fire. However, by that time, all six children remaining in the house were deceased. Four of the adults who escaped sustained injuries ranging from lacerations to first- and second-degree burns.

ANALYSIS OF SIGNIFICANT ISSUES

Fire Safety Education

Prince George's County operates a substantial fire safety education program managed by its fire prevention division. Included among the program elements are three major areas. First, the "Learn Not to Burn" (LNTB) program, published by the National Fire Protection Association, is used in schools throughout the county in grades kindergarten through eight. Second, the Fire Prevention Bureau visits preschools, conducting approximately eight classes per week at four day care centers for ages three through five. Their program is a scaled-down version of the LNTB program, emphasizing the key life-saving points. This preschool program is conducted 12 months out of the year. Third, the Department puts on displays three to four times per year in major shopping malls, handing out brochures and information pertinent to fire problems identified by analysis of the county's recent fire data.

In addition to these programs, the Department provides classes for Parent-Teacher Associations, senior citizen audiences, and numerous civic organizations requesting speakers. A highly successful juvenile arson aversion program was established in 1983 when the Department became an affiliate with the National Firehawk Foundation. This program alone annually assists approximately 50 to 60 children who have experimented with fire or set fires.

Unfortunately, in this fire, the children were all too young to have attended public schools and did not attend preschool due to financial constraints and the availability of baby-sitters within the family. The family seemed unfamiliar with some basic fire prevention measures such as storing matches away from children, education of children regarding use of matches, and smoke detector maintenance.

Juvenile Fire-Setting

Juvenile fire-setting is a significant part of the fire problem in the United States and was the cause of ignition in this fire. The grandparents in this case had tried to get the family to do something about the juvenile problem, but did not succeed. Incredibly, two days after the fire, an aunt of the children awakened to find one of the two children involved in the start of the first fire sitting at the foot of her bed, throwing matches at the bed as she slept.

Previous episodes of fire-setting were treated in a punitive manner. By attempting to cause fear in the child, the child's curiosity was quite possibly increased. In addition, by having threatened the children about using matches, the children failed to notify an adult when the fire got out of hand and did not attempt to wake up their grandmother. Rather, they sought to avoid being caught by returning to their bedroom and closing the door.

The Prince George's County Fire Department operates a two-phase juvenile fire-setter program. After an initial evaluation by a Fire Department investigator, children who are retained in the program are either referred to the Firehawk Program or to professional counselors. The Firehawk Program is a program used in many departments to place juveniles (aged 7-14) with a history of fire-setting with a firefighter in a manner similar to the Big Brother program. The professional counseling program arranges for counseling either through an individual counselor retained by the Department, consultants with the county's health department, or the psychiatric ward of the local children's hospital.

The county's juvenile fire-setting program has recorded a 99-percent effectiveness rate; most of the juveniles treated did not have a reported incident of setting an additional fire. The Fire Department uses an outreach approach, doing press releases on the juvenile fire-setter program on a periodic basis, and advising school counselors through the LNTB program. Typically, the Fire Department evaluates approximately five children per month.

Cause, Investigation, and Community Relations

The Prince George's County Fire Department made a significant investment in determining the cause and origin of the fire. A team of ten Fire Department investigators worked around the clock for 10 days studying every element of the fire and taking witness statements to eliminate all possible accidental causes. Although a kerosene heater was originally suspected (see Figure 19), the investigation determined that the fire must have been started intentionally. Ultimately, the two surviving youngsters were thought to be the likely suspects. To interrogate the youths, an aunt was brought in to question them using questions relayed by the investigators. This probably eased the children's anxiety, and they eventually admitted starting the fire, revealing enough details to verify that they had done so.

With the origin and cause determined, the Fire Department conducted a press conference to release its findings. They made a valiant effort to be compassionate toward the family and the community regarding the loss of so many children, and stressed the lessons learned. Such lessons from the successful investigation of a tragic fire are often well received by the community and are an important vehicle for fire safety education.

The Prince George's County Fire Department also provides the victims with a post-fire guide that answers the many questions raised as the result of having a fire. Various telephone numbers and checklists help a citizen recover after a fire.

Smoke Detector

A single smoke detector was located in the living room on the first floor to protect the household. The detector was located only a few feet from the area of origin; however, the battery had been removed. Nationally recognized standards also would have recommended at least one additional detector to protect the sleeping areas on the second floor.

Prince George's County had passed an ordinance retroactively requiring smoke detectors in all existing dwellings in September 1982. To announce

the new law, the Department issued press announcements and contacted realtors to request their assistance in checking for smoke detectors when selling or buying residences. In addition, the Department distributed brochures regarding the smoke detector ordinance. Since the county does not inspect single-family residences, the Fire Department promotes compliance by education. It also requires that fire and EMS crews responding to a residence check for smoke detectors and issue a correction order if a detector is not present.

Prince George's County also maintains one of the most aggressive smoke detector giveaway programs in the country. The Prince George's County Board of Trade donates 2,000 smoke detectors per year to the Fire Department. Anyone in the county may call the Fire Department and request a smoke detector, which will be delivered by their first due engine company. The Fire Department does not require any qualifications regarding income or owner/renter status. In addition, all fire investigators carry smoke detectors in their Fire Department cars to be given away as needed. The Fire Department also provides detectors in food baskets given to new residents via a community relations program.

Prince George's County also gives batteries free of charge to county residents upon request, and batteries are available free through such clubs as the Tandy Radio Shack Battery-A-Month Club. Despite these county-wide detector and battery programs, the family in this fire did not maintain their detector, nor did they have an adequate number of detectors.

Rapid Fire Spread

The story of this fire adds additional credence to the fire service's message to the public that fire spreads through a house far faster than they may believe possible. With the use of plastics and highly flammable interior finishes and furnishings, the speed of fire and smoke spread in today's residential fire absolutely dictates the need for a smoke detector to protect the occupants. No longer can a fire department be expected to get to the scene in time to perform rescue, as may have been the case 20 years ago.

The message to the public needs to be even stronger: that fire departments, contrary to what we might wish to believe, are not able to rescue occupants in most residential fires. In the majority of cases, either the fire is small and they survive on their own, or the fire and smoke are severe and the occupants remaining in the house at the time the fire department arrives are already dead. The fire service still effects many rescues, but people need to be persuaded to take more responsibility for detection and escape.

Windows in Older Houses

In at least one case in this fire (and in the Pleasantville, Ohio, fire described next in this report), a window proved to be a factor that inhibited exiting. In the bedroom above the kitchen, it appears that the counterweights on the old style double-hung window were no longer connected and that a significant effort was required to open the window. The window may or may not have been able to remain raised on its own.

Fire prevention literature teaching emergency exit drills to date has not given adequate attention to the specific problem of windows being difficult to open. For those who do not practice exit drills, it is likely that such a problem may not be related to fire safety in the homeowner's mind. Accordingly, the fire service needs to get the message out that windows need to be checked to be sure they are free of obstructions and that they will open easily and remain raised once opened. Even if a family were reluctant to practice a complete exit drill, they might be motivated to check the windows.

Overcrowding in Low-Income Areas

A recognized fire hazard in low-income areas is overcrowding within a dwelling. In this case, 15 occupants were all sleeping within a house that was less than 2,000 square feet in area. Overcrowding may also contribute to behavioral problems in juveniles. These same low-income households often are least likely to receive fire prevention messages. Because of the urgency of other problems, they may also be less able to do something about fire-related problems.

LESSONS LEARNED

1. Fire safety education programs should specifically target families with preschool children, low-income families, and adults without children.

Although the Prince George's County Fire Department has a broad fire safety education programthis incident demonstrated that programs concentrated around schools may be inadequate to reach some high-risk groups.

2. <u>Communities must establish and advertise programs for juvenile firesetter counseling, and how to deal with children's curiosity about fire.</u>

The juvenile fire-setter program for Prince George's County is publicized through school counselors, the LNTB program, and in the media. There also is a need to educate parents that fire cannot be made forbidden to young, curious children, but rather should be respected. Even with children in the 2- to 4-year age group, we must teach them what to do with matches or lighters they find. In addition, to satisfy the natural curiosity of children about fire, we should teach children how to light matches under supervision and explain the proper use of fire. And certainly when fire-setting is repeated, it is necessary to seek professional help.

3. Smoke detectors must be maintained.

Failure to properly maintain smoke detectors once installed is a common problem; about one-quarter to one-half of all smoke detectors in homes are out of service at a given moment. A smoke detector without batteries is no better than no smoke detector at all. New and innovative programs are needed to ensure proper maintenance of smoke detectors by as large a fraction of the population as possible. Some people may never listen, and some may be impossible to reach, but we probably can do better than we are doing.

4. Every effort should be made to learn from a major tragedy.

The Prince George's County Fire Department was able to capitalize on increased community awareness after the fire to advertise the importance of

smoke detector maintenance. The Fire Department did an excellent job of dealing sensitively with the local area press. Chief Estepp was ultimately able to get the community to face the sad facts that children in a family had set a fire that killed their siblings and cousins.

5. Questioning of very young juveniles via relatives or friends can be a useful approach.

Here, the children's aunt was the intermediary who asked the children aged two and four the questions posed by fire investigators. It was thought that the children were not likely to have so readily confessed in detail to investigators directly.

6. <u>Public education needs to address the maintenance and operation of windows.</u>

A significant factor in the deaths of some of the children in this fire (and the Pleasantville, Ohio, fire described later in this report) was the improper maintenance of windows needed for escape. Windows in older homes that were counterweighted with lead weights and pulleys that are not properly maintained generally cannot be opened by an adult with one hand while assisting a child with rescue. The fire service has not given significant attention to this problem. It is likely that the problem is widespread and deserving of attention as a separate and additional item from recommendations regarding exit drills. The need to maintain the operability of windows potentially needed to escape, the need to keep the windows free of barriers that cannot be quickly removed, and the need to practice opening them and preparing to escape should all be stressed. Parents of babies should consider how well they can escape holding a child in one arm.

7. <u>Stress management programs for fire personnel can assist in overcoming the trauma of tragedies such as child fire fatalities.</u>

In this incident, many firefighters were devastated by the deaths of so many children. Recognizing the increased emotional stress of a job such as firefighting, Prince George's County, as does many other fire departments, operates a critical incident stress debriefing program for personnel after incidents such as this. By allowing personnel to talk with a trained counselor, the level of stress and emotional damage may be reduced and personnel returned to peak operating efficiency sooner.

In the case of Prince George's County, the employee assistance group is trained in the basic elements of critical incident stress debriefing, and the program is supported by professional counselors. Prince George's County's program has successfully been in place three years.

8. Residential sprinklers can protect homes even when prevention fails.

Prince George's County is the first community in the nation to pass an ordinance that will require all new houses to be built with sprinklers by 1991. A single sprinkler head would have easily controlled the fire in this case.

Appendices

Photographs, Diagrams Showing Where Photographs Were Taken, and Floor Diagrams.

Fire Department Incident Report, Investigation Report, and Dispatch Transcript.

Appendix H

- FIGURE 1: After the fire at 203 69th Street.
- FIGURE 2: First-floor plan showing area of origin; also notes positions from which photos were taken.
- FIGURE 3: Second-floor plan showing location of fatalities.
- FIGURE 4: Family tree of occupants.
- FIGURE 5: Area of origin in living room. Grandmother was asleep on couch at right.
- FIGURE 6: First phase of fire growth and occupant locations (numbers identify the occupants). The children who started the fire (occupants 2 and 3) had gone back to their bedroom.
- FIGURE 7: Second phase of fire growth and occupant locations. Grandmother (1) escapes.
- FIGURE 8: Front porch area where fire first spread to second floor.
- FIGURE 9: Lightweight soffit under porch roof allowed rapid fire spread.
- FIGURE 10: Area around dormer where fire first entered second floor.
- FIGURE 11: Window from which the 23-year-old daughter escaped. The window closed behind her.
- FIGURE 12: Area in front of the bedroom where a 4-year-old grandson (occupant 4) originally tried to escape.
- FIGURE 13: Third phase of fire growth and occupant locations.
- FIGURE 14: Looking up the rear stairway where occupant 5 re-entered.
- FIGURE 15: Hallway at the top of the rear stairs where occupant 5 was forced to abandon rescue attempts.
- FIGURE 16: Fourth phase of fire growth and occupant locations.
- FIGURE 17: Rear of the house. Note the second floor doorway where the 21-year-old son (occupant 5) escaped after his rescue attempt.
- FIGURE 18: Fifth phase of fire growth and occupant locations.
- FIGURE 19: Location of the kerosene heater originally suspected to have ignited the fire.



FIGURE 1
After the fire at 203 69th Street.

FIGURE 2

 \triangleleft

PHOTO KEY:

△ = FIGURE NUMBER AND LOCATION

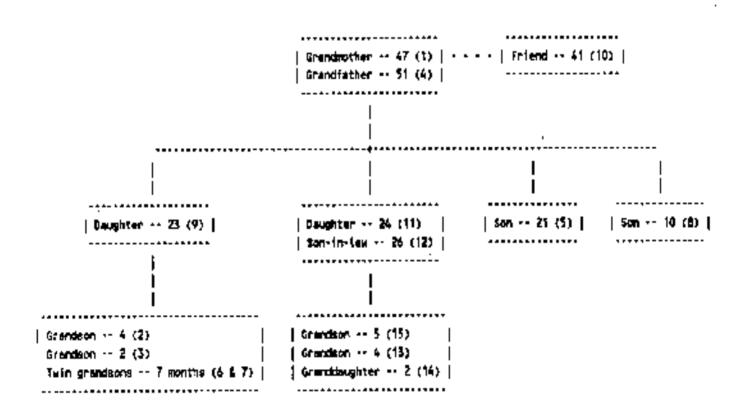
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XIX 6004 STREET SEAT PLEASANT

REAH PORCH

FIGURE 3.

FIGURE 4
FAMILY TREE OF OCCUPANTS



Occupant age is followed by an assigned occupant number (in parentheses)



FIGURE 5 Area of origin in living room. Grandmother was asleep on couch at right.

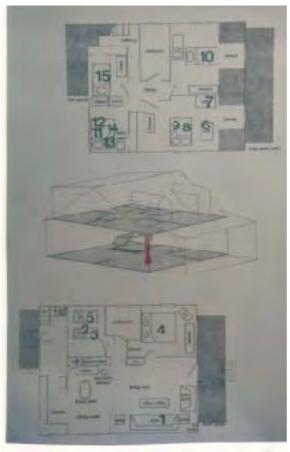
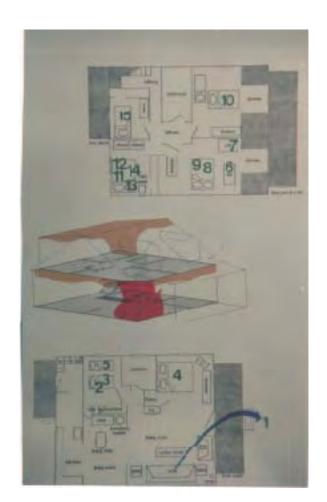


FIGURE 6

First phase of fire growth and occupant locations (numbers identify the occupants). The children who started the fire (occupants 2 and 3) had gone back to their bedroom.



Second phase of fire growth and occupant locations. Grandmother (1) escapes



FIGURE 8

Front porch area where fire first spread to second floor.



FIGURE 9
Lightweight soffit under porch roof allowed rapid fire spread.

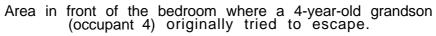


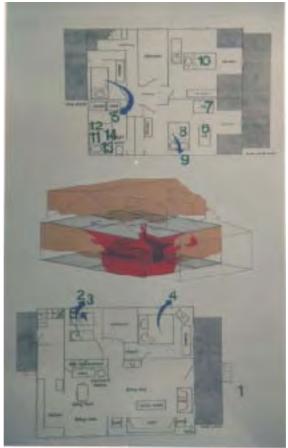
Area around dormer where fire first entered second floor.



FIGURE 11
Window from which the 23-year-old daughter escaped.
The window closed behind her.







Third phase of fire growth and occupant locations.



FIGURE 14

Looking up the rear stairway where occu pant 5 re-entered.



FIGURE 15

Hallway at the top of the rear stairs where occupant 5 was forced to abandon rescue attempts.

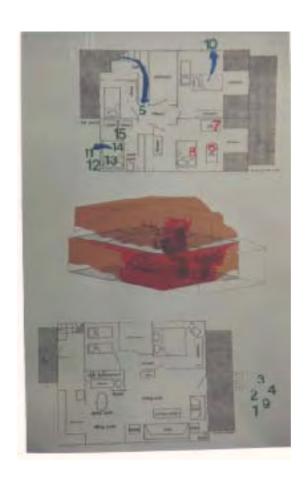


FIGURE 16

Fourth phase of fire growth and occupant locations.



FIGURE 17

Rear of the house. Note the second floor doorway where the 21-year-old son (occupant 5) escaped after his rescue attempt.

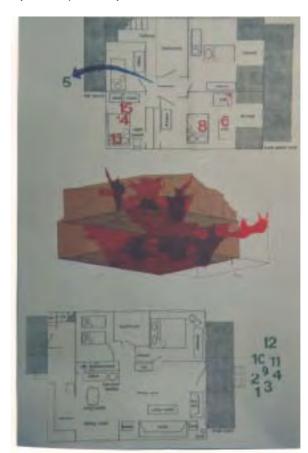


FIGURE 18

Fifth phase of fire growth and occupant locations.



FIGURE 19

Location of the kerosene heater originally suspected to have ignited the fire.

APPENDIX I

FIRE DEPARTMENT INCIDENT REPORT, INVESTIGATION REPORT, AND DISPATCH TRANSCRIPT

PRINCE GEORGE'S COUNTY, MARYLAND

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JPRINCE GEORGE,S COUNTY, MARYLAND Fire Department FIRE INVESTIGATION REPORT

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FD INCIDENT NUMBR: A87077769

INCIDENT LOCATION: 203 69TH ST

TIME ALARM RECEVD: 080427

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INIT INCIDENT TYP: 1A FD REPORTING AREA: 0809

ALARM RECEVD : 0804

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1ST UNIT ENR : 0807

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ABNORMAL RESP: 0810

UNIT ENR : 0810 SUPPMTL TRANS: 0810

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AVAIL IN QTRS: 0815

MISC ENTRY : 0815

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NEW LOCATION : 0853 NEWLOC203 69TH ST

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UNIT ENR : 0858 SOD

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MISC (5035). CAR 553 PIERCE DAMEWOOD ER
  MISC ENTRY: 0939
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  MISC ENTRY : 1003
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e de la persona

Six Children Die in House Fire Pleasantville, Ohio December 18, 1987

Jeffrey M. Shapiro, P.E.

Report number 4 of 4.

SIX CHILDREN DIE IN HOUSE FIRE

Pleasantville, Ohio December 18, 1987

Investigated by: Jeffrey M. Shapiro, P.E.

Local Contacts: William B. Hammond, Jr.

Fire Chief

Pleasant and Walnut Townships Fire Department

P.O. Box 147

Pleasantville, Ohio 43148

(614) 468-3214

Terry Webber

Chief, Fire Prevention

Ohio State Fire Marshal's Office

8895 East Main Street Reynoldsburg, Ohio 43068

(614) 864-5510

OVERVIEW

Six children died in a private home fire in Pleasantville, Ohio, on December 18, 1987. The adult caring for the children, a mother of three and aunt of the other three, left a pot of water heating on the stove and fell asleep. She was overcome by smoke, but was the sole survivor. This was one tragedy among many, for 24 children were killed in fires in Ohio that month alone.

The family involved was concerned about fire safety and had a working smoke detector. But it was not in a proper location, and there were wooden bars across a key window needed for escape.

BACKGROUND

Pleasantville, Ohio, is a town located in the distant suburbs of the city of Columbus. The town is a bedroom community characterized by older homes housing middle-income families. Fire protection is provided by the Pleasant and Walnut Townships Volunteer Fire Department, an all-volunteer organization. The Fire Department also provides emergency medical services and has a large, well-maintained fire station with a variety of up-to-date fire suppression and

SUMMARY OF KEY ISSUES

Issues Comments

Fire Cause	Unattended pan on stove on first floor.
Casualties	Killed six children and injured one adult. Occurred in evening while occupants slept.
Smoke Detectors	Had new battery which had been tested recently. Detector not in a recommended location. Detector apparently did not go off.
Delayed Report	Reporting to fire department delayed by neighbors' rescue efforts.
Human Behavior	Occupants were awake and together before succumbing.
Windows	Window needed for escape apparently would not remain raised by itself. Owner-installed protective bars inhibited exiting.
Structure	Two-story wood frame dwelling; fire spread rapidly. Low ceiling (7') in bedroom where deaths occurred.
Fire Prevention Education	Statewide fire safety education program in schools. Local volunteer fire department conducted fire safety education classes attended by one child. Family involved was concerned about fire safety but nevertheless made several errors in safeguarding house.
Response Time	Local fire station was immediately next door to fire scene.

emergency medical vehicles, all staffed by well-trained personnel. Dispatching is handled by three dispatchers who work at home and have the ability to alert Fire Department members through a pager network. Although the fire station is normally unmanned, the Fire Department is proud of its record of normally being able to put a first-due vehicle on the street within two minutes after an alarm is dispatched. Several firefighters live or work within a few doors of the station.

THE HOUSE

The house where the fire occurred was immediately next door to the Pleasant and Walnut Townships Fire Station (see Figure 1 in Appendix J; a photo location key is provided in Figures 12 and 13). The house was wood frame and built around 1900. It had been divided into two sections, each of which was rented separately. The section where the fire occurred was two stories, and the other section was a single story. The side where the fire occurred was occupied by a family who had been living in the house as renters for approximately I-1/2 years. The family consisted of a husband, wife, and three children ranging in age from a new baby to seven years.

The floor plan of the house is detailed in Figures 2 and 3. Upon entering from the front, one would walk through the living room into the dining area, from which an open stairwell led to the second story. Beyond the dining area is the kitchen, where the fire originated. On the second floor, an open area at the top of the stairs provides access to three bedrooms and a bathroom. As is typical in many older homes, the ceiling height in the second-story bedrooms is only seven feet, providing little space for smoke to accumulate before banking down from the ceiling level and endangering occupants.

The windows on the second floor were sited low on the wall, with the bottom sill of the window just above floor level. Because of the danger of a child falling through the window, protective bars had been installed inside over their lower section. These bars were constructed of wooden dowel rods framed into supports on the top and bottom, which were screwed into the window frame (see Figure 44

An owner-installed smoke detector was located on the first-floor ceiling just above the base of the open stairway (see Figures 5 and 6). The detector is thought to have been functional since the occupant changed the batteries only two weeks before the fire and tested the detector with smoldering paper; it also had alarmed previously from cooking. There was no detector on the second level, where the bedrooms were located.

THE FIRE

On the evening that the fire occurred, the parents of the household were attending a Christmas party away from home. The regularly scheduled baby-sitter had canceled at the last minute, and the husband's sister, who had baby-sat for the family many times before, volunteered to substitute. This aunt, in her late 20s, had three children of her own whom she brought with her to spend the night, thereby placing six children and one adult in the house. Although many accidental fires involve adults under the influence of alcohol or drugs, the adult in this incident was a religious woman with no history of alcohol or drug problems. (We shall refer to the woman who was watching all of the children as the "aunt," even though she was the mother of some of the children, to remind the reader that the household was not her own and that she was baby-sitting.)

Having put the children to bed for the night, three in each of the two connected bedrooms, she went downstairs and put a pot of water on the stove to heat for making coffee. She then heard the children making a commotion upstairs and went up to determine the problem. The children said they were afraid of "monsters" and did not want to be alone. The aunt decided to lie down in bed with the children in the bedroom that is most remote from the hallway until the children fell asleep. Apparently having forgotten about the pot of water on the stove, she fell asleep as well.

Sometime after 1000 hours, the pot on the stove apparently boiled dry and radiated sufficient heat to the adjacent wall to ignite the wall covering. Evidence linking the pot on the stove as the cause of ignition is fairly conclusive. The aunt remembered leaving the water on the stove. The base of the pot was found melted to the burner, which was found in the "on" position (see Figure 7).

A neighbor who lived across the street was driving home when he noticed a large volume of smoke issuing from the area of the fire station. Upon closer examination, he found the smoke to be coming from the house immediately next door to the station. He went in the front door of the house, which had been left unlocked, and attempted to determine if anyone was home by yelling inside. At this time, there was very heavy smoke on the first-floor level, preventing the neighbor from entering more than a few feet. He was only 15-20 feet from the detector and did not hear any alarm. Through the smoke, he saw the glow of the fire burning in the kitchen.

Hearing no answer, he retreated outside. He then went a few houses down the street to the home of a Fire Department member to get help. The firefighter's wife called in the alarm, but a second neighbor had already done so by now. While the firefighter dressed, the neighbor returned to the fire scene.

At that time, the aunt who was baby-sitting was standing at the second-floor window indicated in Figure 1. The lower portion of the window had been raised, and she was screaming and waving her arms outside. The neighbor then climbed onto the lower roof level, which was located just below the window, and went to rescue the woman. When he got near the window, she said something that was unintelligible, turned away, and the window closed. The window apparently was unable to remain in the up position without being held, and it is suspected that when the aunt turned away, presumably to get the children, the window dropped.

As it did, the firefighter whom the neighbor had notified arrived at the scene, and the neighbor climbed down from the roof and went to advise the firefighter that there was a woman trapped upstairs. He and the firefighter then went next door to the fire station and got a Fire Department ladder to attempt rescue. When the firefighter got to the window, he decided that the glass was so hot that opening the window might draw the fire through the house and kill the occupants. He therefore did not immediately open the window.

The first call was received by the Fire Department at 1020 from a neighbor liv ing across the street from the house. Dispatch was rapid, and in one minute the first responding unit marked on the air and on the scene. The time of

dispatch was approximately the same time that the firefighter living down the street had entered the fire station to get a ladder, so arrival of a firefighter on the scene was almost immediately after receipt of the alarm.

After his decision not to open the window, the firefighter who had been on the roof went back to the station to get full turnout gear. Shortly thereafter, the first responding engine began to set up hose lines. While the firefighters were setting up, the fire apparently flashed over and vented through the kitchen window, but the Fire Department estimated that within a minute and a half to two minutes after arrival, they had knocked down the bulk of the fire.

Fire damage was limited to the kitchen, utility, and bath areas, where heat damage was quite extensive (see Figure 8). An old, unused chimney located behind the kitchen ceiling likely played a large role in inhibiting the passage of fire and superheated gases into the dining area and upstairs by providing a vertical vent directly outside once the ceiling had failed. This venting action would have delayed flashover and perhaps was the only reason that the occupants had any chance of survival at all.

As soon as the fire had been knocked down, the firefighters entered the second floor through the exterior window and began removing the occupants. All occupants were reported to have been removed at 1031, approximately 10 minutes after arrival on the scene of the first due unit.

The aunt was found immediately adjacent to the bedroom window, and the six children were found just inside the same bedroom's door, which--based on the burn pattern--had been open during the majority of the fire but was closed by the occupants sometime before the Fire Department made entry (see Figure 9). Three children were found to the left of the door, and three children were found to the right of the door. This indicates that they had been awake and moving about before becoming unconscious. The aunt had gathered all of the children in one room. Based on the smoke stains on the sheets in the baby's crib, the sitter had removed the baby from the crib after the smoke had already become very thick in the bedroom. All victims were discovered in cardiac arrest.

The Fire Department established a triage area in the engine room of the fire station next door. Victims were treated by Fire Department paramedi cs and

EMTs, who had immediately begun CPR and initiated intravenous fluids. Two of the victims were evacuated to a local hospital by helicopter, and the remainder were transported via ambulance. The baby was pronounced dead on the scene. Three children were pronounced dead at the hospital, and the last two children died shortly after their arrival at the hospital. The aunt was successfully resuscitated at the fire scene and survived the incident.

All fire units cleared the scene just after midnight; however, back at the station, the firefighters participated in the first of several critical incident stress debriefings (CISDs). Given the magnitude of this tragedy, the chief made an extra effort to ensure that his personnel received counseling by a CISD-trained specialist in several later sessions.

ANALYSIS OF SIGNIFICANT ISSUES

Fire Safety Education

Residents of Pleasantville were in the jurisdiction of two fire safety education programs. The first, operated by the State Fire Marshal's Office, is targeted for grades kindergarten through four, and highlights 17 key lessons, including stop, drop, and roll; crawl low in the smoke; exit drills in the home; how to call the fire department; etc. In addition, programs conducted by the State Fire Marshal's Office provide take-home information for children to give parents on smoke detector education. Only one child in this incident was old enough (seven years of age) to have attended such a program. However, based on the State Fire Marshal's records, it is unlikely that the child had attended the state-sponsored program as of the time of the fire.

The local Fire Department also conducted a safety education program in the schools that included grades kindergarten through four. The curriculum involved having the children visit the local fire station and participate in interactive presentations of stop, drop, and roll; exit drills; and smoke detector education. As did the state program, the Fire Department's program included brochures on these topics. It is believed that the seven-year-old child killed in this incident had indeed attended the Fire Department's class.

According to interviews with family members, the mother of the three children who lived in the house had practiced with them how to get out in case of fire and what to do if their clothes caught on fire. In addition, the mother tested and maintained the smoke detector because she reportedly considered the house a fire trap. These fire safety efforts are thought to be a direct result of the pamphlets brought home by the oldest child. It is not known why the mother did not consider the "baby bars" installed over the second-floor windows an obstruction to emergency exiting (she was not available for interview).

Problem with Escape Windows

As was true in the Prince George's County fire discussed previously in this report, it appears that the old windows in this residence were unable to remain open on their own. Hence, the window shut when released by the aunt. She also had to cope with the bars on the windows, which were present in the adjacent bedroom as well. They did not have a quick-release mechanism.

Ratio of Children to Baby-sitter

With so many children to evacuate in so little time, plus the problem of the windows, it is clear that the aunt had been pressed to evacuate herself and all six children, especially with the children being so young. She successfully had gathered all the children together and had the door to the room closed, but could not get them out before being overcome. Coping with the window problem and the children, all in heavy smoke, was overwhelming. The aunt could not remember details of her actions immediately prior to being overcome. Her glasses were found on a nightstand; not having them may have contributed to her difficulties.

Time for Escape or Rescue

This incident is an excellent example of the need for citizens to purchase and properly locate and maintain smoke detectors, and not just rely on the local fire department to successfully perform rescue. Figure 10 shows the estimated timeframe of events versus fire growth for this incident. It shows the greater escape time available for a residence properly protected by a smoke detector versus a residence that is not.

Fire protection professionals usually consider that people in the immediate vicinity of a fire at flashover will almost surely be severely injured or perish. Had this residence been properly protected by a detector, there would have been an estimated seven minutes to escape before flashover occurred. Without the detector giving early warning, occupants became aware of the fire about three minutes before flashover, during which time conditions were rapidly deteriorating. However, it is possible that even in the conditions present, there would have been adequate time for the aunt to evacuate herself and the children had the baby bars not been present and had the window remained open.

The Fire Department's response in this case was optimal. The combination of a prompt dispatch, one minute get-out and response time, and two minute set-up time until extinguishing operations begin could not be surpassed except in very rare instances. The key factor was the delayed detection.

Examples of the time scale of the fire growth versus fire department and victim actions such as shown in Figure 10 may be useful to local fire departments to graphically demonstrate the need for smoke detector laws. It is clear that with the rapid fire growth scenario experienced in today's residential occupancies, occupants need early warning to help survive in fires.

Smoke Detectors: Still More To Do

Overshadowed by the tragedy of the deaths of six children is the tragedy of the failure of such an extensive fire safety effort by the Fire Department and the family. Here is a case where a smoke detector was installed by the owner of a rental property, the rental occupant received smoke detector maintenance information, and the occupant practiced proper smoke detector maintenance. It is almost certain that the smoke detector was functional at the time of the fire. The Fire Department investigators were told by the occupants that the detector had alarmed previously when a towel had caught fire on the stove. In addition, approximately two weeks before the fire, the wife placed a new battery in the detector and tested the detector with a smoldering paper. The detector was found operational in this test.

The failure here was that the detector was not installed in a recommended location (see Figure 2). In a two-story residence such as this one, at least one detector should have been located on the second floor outside of the

sleeping areas (see Figure 11). The location selected was particularly troublesome because the detector was adjacent to a large stairway opening and remote from the area of origin. The smoke was able to leave the kitchen and pass up to the second floor without reaching the detector. It should be noted that although the detector was not located in the position recommended in the manufacturer's instructions, no statement was made in the instructions indicating a significant problem with a location adjacent to a large ceiling opening such as a stairway, as was indicated for areas adjacent to air supply vents.

It is unclear why the detector had operated properly when a towel was set afire on the stove, but it is likely that the type and temperature of smoke was different because of the fire size and material involved. A low-energy towel fire could produce light smoke that is relatively cool and follows room air circulation patterns, whereas a rapidly burning, high-energy fire such as occurred in the later incident can produce entirely different flows.

In this incident with rapid fire growth in the kitchen, the heated smoke could have quickly gone up the stairwell and not reached the smoke detector. The smoke detector might have operated for a short period later in the fire as the smoke became very intense, which would have been a delayed alarm, but--due to its location--it is possible that by the time the detector would have operated, the temperatures had gotten so hot that the detector was already disabled. (The detector was found to have melted and fallen to the floor; it did not work when found.)

Property Damage Was Limited

There was only a small amount of heat damage beyond the dining area. Temperatures in the living room are thought to have never exceeded 300°F, given that sheer curtains on the front door remained intact and some plastic candles located in the front window melted only slightly. Upstairs, the extent of visible damage was a light soot covering of exposed surfaces and a slight blistering of paint on the upper portions of doors and door frames. The overwhelming feeling after examination of the bedroom where the bodies were found was the disbelief of how six people could have died and yet there could be so little property damage. A review of three of the coroner's reports made

available showed carbon monoxide levels ranging from only 2.6 percent to 18.9 percent. No autopsies were performed, but the fatalities were all thought to be caused by smoke inhalation.

Documentation of fire tests, such as depicted in the recent NFPA film "Firepower," have shown that gases given off by the fire can cool rapidly after traveling as little as 20 feet from the seat of the fire, especially when venting is present. Therefore, it is speculated that at the time smoke reached the upstairs bedroom, its temperature was probably 150°F-200°F, which would be survivable for a short period. However, the firefighter feeling the glass from the outside sensed this temperature as "hot." Should the firefighter have opened the hot window and gone for rescue without protective gear?

If the fire was in a backdraft situation and oxygen-starved, opening the window could have caused an explosive burning that could have killed the firefighter and the family. He considered that and decided not to risk it.

Some firefighters and engineers have felt differently in hindsight, but we could not recommend a different decision with the information that the firefighter on the scene had.

LESSONS LEARNED

1. <u>Smoke detector literature should further clarify the proper and improper placement of detectors.</u>

Although this incident demonstrated proper action on the part of the owner to install a smoke detector, it is apparent that the information provided with the detector either was not reviewed by the installer, not understood, or not properly followed. In addition, the information brochure provided by the Fire Department to the occupant did not adequately specify proper location criteria, and the occupant probably assumed the location was all right. A 1980 study by the International Association of Fire Chiefs for the U. S. Fire Administration showed that placement was correct in over 90 percent of the homes checked, but that still leaves many homes with a potential problem. There has been no recent or broader study. In circumstances such as this where the detector is installed

by the owner and not the occupant, precise installation advice would prove helpful. Smoke detector literature and fire prevention information should be reviewed in this regard.

2. Fire safety education should include safety practices for baby-sitters.

Considerations such as checking emergency exit routes, baby-sitter-to-child ratios, and sleeping with bedroom doors closed should be included in fire safety education programs and materials for baby-sitters and other child care-givers. In this case, the baby-sitter was the children's aunt and familiar with the house. But even she would not necessarily know how to remove a homemade window barrier in heavy smoke with six scared children around her.

3. Fire safety education should point out the inability of fire departments to provide rescue in many instances.

Citizens may rely on the fire department's ability to rescue them too much. The attitude that fire safety is a personal responsibility of citizens needs to be instilled. More fire prevention education is needed to prevent fires such as this and to make sure the crucial details of detection and escape are understood by all citizens.

4. Fire prevention programs need to address the obstruction of secondary exits in residences.

With concerns for home security and protection from falls, homeowners turn to placing bars, locks, etc., on windows. Such behavior disregards fire safety. It is incumbent upon the fire service to educate their communities about the security versus fire safety dilemma. This is especially important in areas where citizens are highly aware of crime problems and may be blind to fire hazards that their anti-crime precautions may create.

Again, in this fire, as was the case in the fire in Prince George's County, the failure of windows to remain open on their own can be directly linked to the deaths of several children. The need to address this problem may be significantly greater than currently thought. Fire safety educators should take

specific measures to educate homeowners regarding the hazards of windows that will not remain up on their own, especially in circumstances where small children are present.

5. <u>Stress debriefing sessions are important for the well-being of firefighters.</u>

As was the case in Prince George's County, the Pleasant and Walnut Townships Volunteer Fire Department engaged a professional counselor for critical incident stress debriefings to ease the effect on personnel of experiencing a tragedy of this magnitude. Fire departments without such a program should establish one for the well-being of their personnel.

Appendices

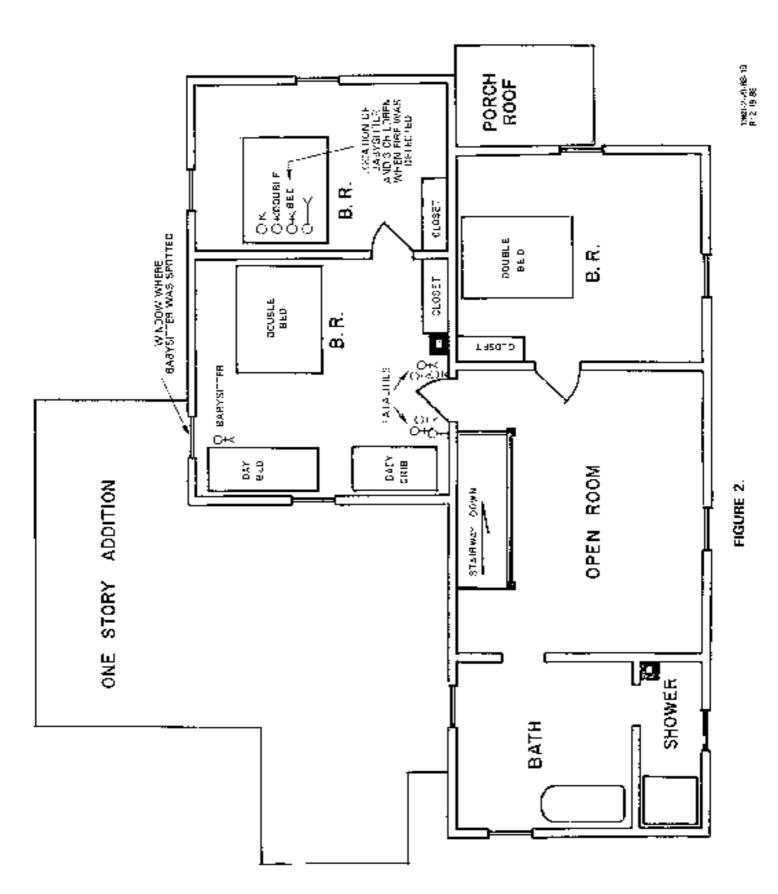
- J. Photographs, Floor Diagrams, and Time Temperature Graph
- K. Fire Department Incident and Casualty Reports.

Appendix J

- FIGURE 1: A three-quarter view of the rear of the house. The arrow points to the window where the woman was seen screaming for help. Note that it is located immediately above a lower-level roof, to which escape could have been made if the windows had not been barred.
- FIGURE 2: Second-floor plan, shows location of fatalities.
- FIGURE 3: First-floor plan, shows area of origin and smoke detector location.
- FIGURE 4: Due to the low elevation of the windows in the second-floor bedrooms, homemade bars had been installed to prevent a child from accidentally falling through the window.
- FIGURE 5: General location of the smoke detector at the base of the stairwell.
- FIGURE 6: Specific location of the smoke detector on the ceiling adjacent to the stairway opening. This is not a preferred location.
- FIGURE 7: Area of origin around stove.
- FIGURE 8: Actual fire damage to the house was relatively limited. The only significant evidence of a fire on the exterior of the house was above the kitchen window, where the fire ventilated during flashover.
- FIGURE 9: Just inside the bedroom, the six children were found behind the closed door (which was closed during the fire). Three children were found on the left of the door, and three children were found on the right of the door. Note that the baby had been removed from the crib.
- FIGURE 10: Estimated time sequence of events versus fire growth (time/temperature graph).
- FIGURE 11: All seven of the fire victims were inside the bedroom on the left. Note the location of the doorway (which was open) with respect to the stairwell opening, allowing smoke direct access into the bedroom, and the low ceiling of the bedroom, which would have caused a rapid descent of the smoke layer.
- FIGURE 12: First floor plan showing positions from which photographs were taken.
- FIGURE 13: Second floor plan showing positions from which photographs were taken.



A three-quarter view of the rear of the house. The arrow points to the window where the woman was seen screaming for help. Note that it is located immediately above a lower-level roof, to which escape could have been made if the windows had not been barred.



SECOND FLOOR PLAN H2 E. COLUMBUS ST. PLEASANTVILLE, OHIO



Due to the low elevation of the windows in the second-floor bedrooms, homemade bars had been installed to prevent a child from accidentally falling through the window.



General location of the smoke detector at the base of the stairwell.



Specified location of the smoke detector on the ceiling adjacent to the stairway opening. This is not a preferred location



Area of origin around stove.

FIGURE 8



Actual fire damage to the house was relatively limited. The only significant evidence of a fire on the exterior of the house was above the kitchen window, where the fire ventilated during flashover.

FIGURE 9



Just inside the bedroom, the six children were found behind the closed door (which was closed during the fire). Three children were found on the left of the door, and three children were found on the right of the door. Note that the baby had been removed from the crib.

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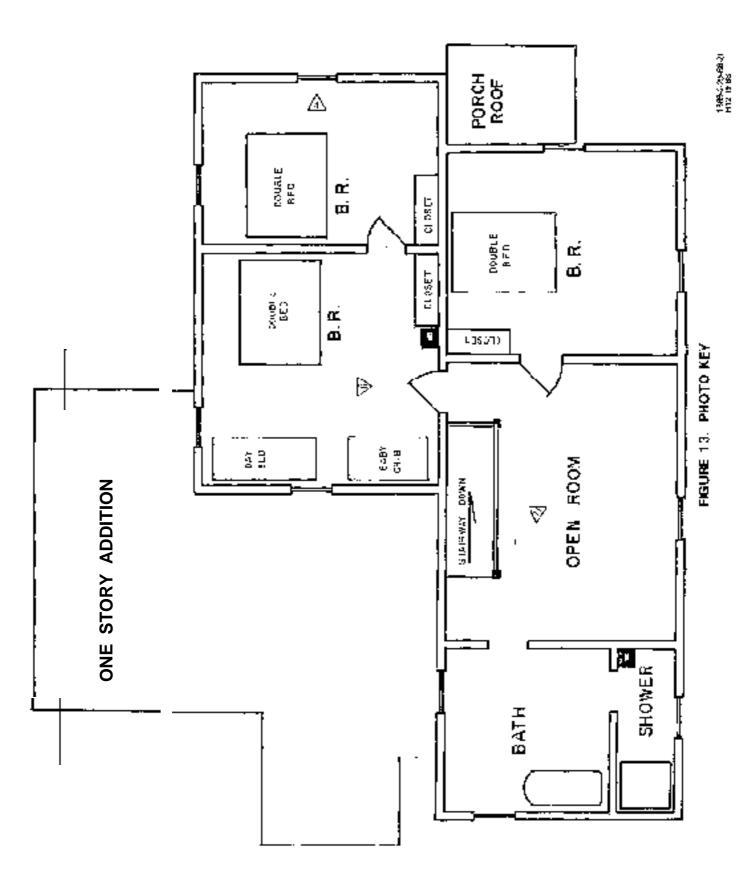
FIGURE 10 ESTIMATED TIME SEQUENCE OF EVENTS VERSUS FIRE GROWTH

FIGURE 11



All seven of the fire victims were inside the bedroom on the left. Note the location of the doorway which was open) with respect to the stairwell opening, allowing smoke direct access into the bedroom, and the low ceiling of the bedroom, which would have caused a rapid descent of the smoke layer.

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APPENDIX K

Fire Department Incident and Casualty Reports

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CASUALTY FCCI

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CORONER HOOSDEN, PRONOUCED WICTEM
DECEASED & RELEASED VICTIM TO SMATH FUNERAL
HOME, LANCASTER

CASUALTY #002

TRANSPORTED TO CHILDREN'S NOSPITAL, COLUMBUS BY GRANT LIFE FLIGHT, TREATED AND ADMITTED TO I.C.U., PRSSED AWAY 12-19-87

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CASGALTY " LOT "

TRANSPORTED TO CHELDHEN'S MOINTAL, COLUMBUS BY GRANT LIFE FLIGHT, ADMITTED TO I. C.M., PASSED RUMY 12-19-81

CASUALIY ** 008

TRANSPORTED TO LANCASTER-FAIR FIELD COMMUNITY HOSPITAL EMERGENCY ROOM, TREATED AND RELEASED.

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CASUALTY 1-005

TRANS PORTED TO LANCASTER-FAIRFIELD

COMMUNITY HOSPITAL, AFTER LIFE SAVING

TECHNIQUE'S WERE PERFORMED IN EMERGENCY

ROOM, VICTIM WAS PRONOUNCED DECERSED.

CASUALTY # 006

TRANSPORTED TO CHILDREN'S HOSPITAL, COLUMBUS BY GRENT LIFE FLIGHT, TREATED IN EMERGENCY ROOM, PASSED AWAY 12-19-87 AT ABOUT 0038 HRS.



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CASUALTY " TOB

TRANSPORTED TO LANCASTOR FAIRFIELD COMMUNETY
HOSPITAL, AFTER LIFE SAKING TICHNIOUE'S WERE
PER FORMED IN EMERGENCY BOOM, VICTIM WAS
PRONOUNCED DECEASED.

CASUALTY # 004

TRANSPORTED TO LANCASTER-FAIRFIELD COMMUNITY HOSPITCH, AFTER TREATMENT IN EMERGENCY ROOM, VECTIM WAS ADMITTED TO I.C. U.