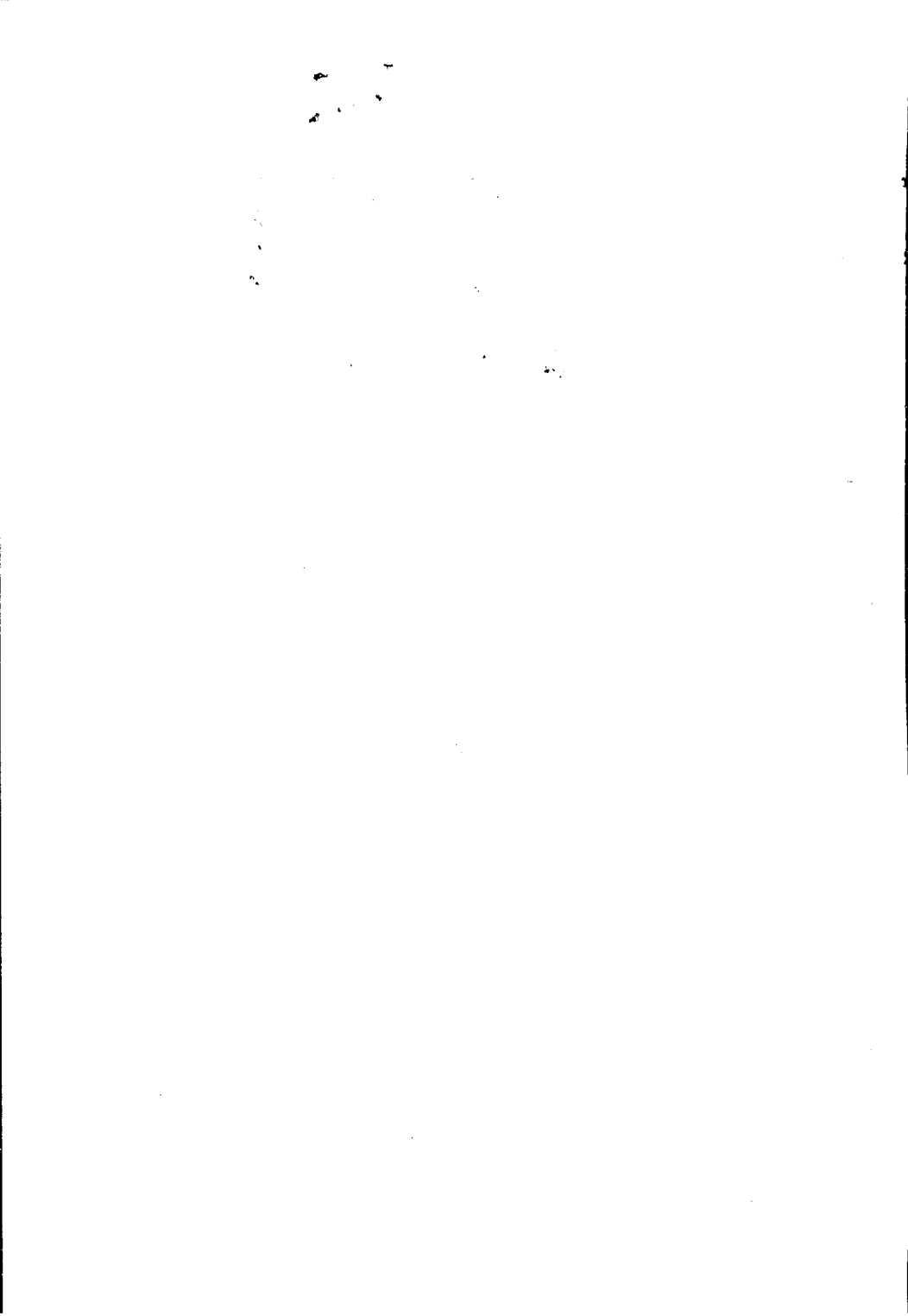


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NCJRS

FEB 9 1979

ACQUISITIONS

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# ARSON

has become one of the most expensive crimes in the United States and Canada. Its incidence is growing at an ever-increasing rate and it may account for more than \$2 billion a year in losses. Between 15 per cent and 30 per cent of all building fires and one-third of dollar losses from fires are attributed to arson.

Firemen have several key responsibilities. One is to put out fires. Another is to attempt to save the lives of people trapped in burning buildings. Yet another is to determine how and why a fire started. Knowing the cause of a blaze and publicizing it may help prevent future fires of the same type. But it is also a key duty because an investigation may show that the fire was no accident—it was deliberately set. That's called arson. . .and that calls for further, decisive action.

Many firemen, frankly, have not been well-trained in determining the causes of fires. Many metropolitan area fire departments have arson investigation units made up of trained men who know what to look for in sifting through the rubble of a fire. But most firemen in medium-size, small-city and rural departments have had no special training in fire investigation. Of course, these firemen would recognize an obvious arson job—strong smell of gasoline in the building, empty metal containers found nearby. But they would miss other common but less apparent signs that indicate arson. In writing their report, they might either list the fire's cause as "unknown" or blame it on some familiar, convenient villain—"faulty wiring," "overheated furnace" or whatever—when a competent, careful investigator would have found the fire actually was deliberately set.

This is why no one knows for sure how widespread arson is. . .and why most arsonists are never convicted. . .and why, with little threat of being caught hanging over the perpetrator's head, arson continues unabated.

This booklet by itself will not tell you all you need to know about arson; it is not designed as a short course in arson investigation. Rather, it is aimed at making you aware of the arson problem; giving you some basic "how-to-do-it" advice on fire investigation; telling you what steps to take once you have determined a fire was arson; and informing you about available training that will make you a more capable investigator.

Man the hose  
and keep your eyes on the fire.

MAN THE HOSE



**W**hile recognizing that not all fires are arson, the fireman needs to realize that any individual fire **could** be...until another cause is determined. It's important that you keep this in mind from the moment you receive the alarm, since some indicators of arson may appear even before the fire is put out.

Get the name, address and phone number of each person calling in the alarm; sometimes an arsonist himself reports the fire. While en route to the scene, look for the unusual: persons running away from the fire, or a car leaving the area speedily or (at night) with its lights off. Try to get the license number of any such car.

On arriving at the scene, your first concern, of course, is fighting the fire. But in the course of doing so, you'll probably have time to ask questions and make observations that will help you later in your investigation. For example:

Are the premises occupied? Are doors and windows open or shut, locked or unfastened? Any signs of forcible entry? Are the window blinds pulled, or are windows otherwise covered to obstruct the outside view into the building?

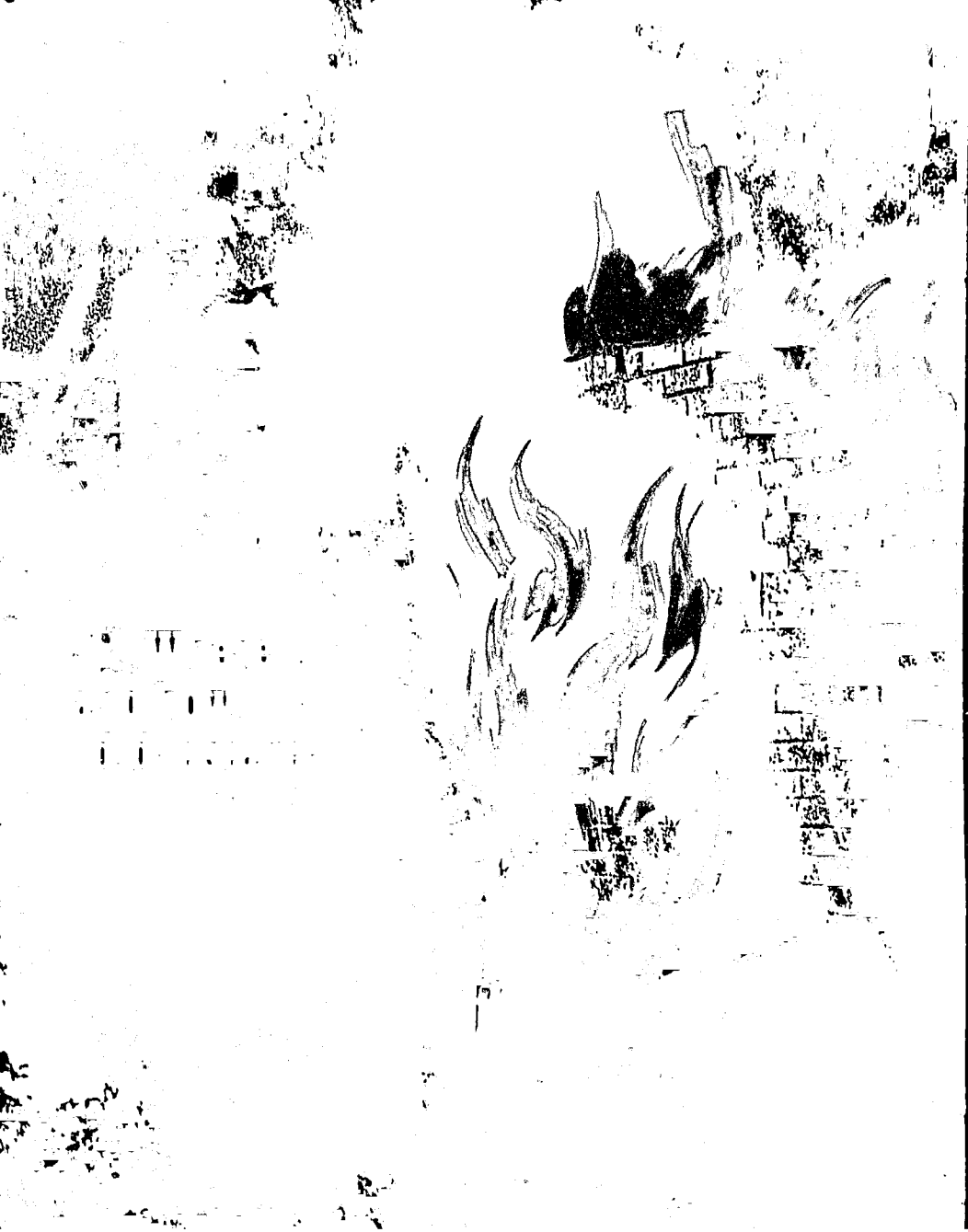


Observe the type, color and odor of the smoke and flames; these can indicate whether gasoline, kerosene, turpentine or another accelerant (material that spreads and intensifies fires) was used. Was there an explosion? Are there two or more separate fires burning, and does the fire appear to be spreading unusually fast? "Yes" answers to these questions may indicate arson.

If possible, note the direction in which the fire is spreading. Most fires spread vertically until they are blocked by some obstacle; the flames then mushroom out horizontally, "looking" for some way around or through the obstruction. This horizontal spread normally is slow. If it is fast, extra ventilation may have been provided, or wall surfaces may have been treated with a flammable substance—signs of arson.

Do you see any spectator who also has been at several other recent fires? Or is there a spectator who goes out of his way to "help" the firemen, or asks a lot of questions about the fire? He could be a pyromaniac—a mentally unbalanced person who sets fires for the pleasure of watching them burn.







Once the fire is out, your task is to begin examining what's left of the building for physical evidence that may indicate how the blaze began. Arrange for posting of guards to keep unauthorized persons off the premises while firemen are away. Also, it's important that you avoid undertaking an immediate cleanup of the property; you might destroy valuable evidence if you clear away the debris too soon.

The first step is to determine where the fire started—the point of origin. If there were any eyewitnesses to the fire's early stages, they may be able to help you—but don't rely on their word alone. Point of origin is found by studying patterns of charring—the ways in which wood-based materials turn to charcoal while burning. Generally, the lowest point of burning and the deepest, most severe char area indicate the point of origin. "Lowest point" does not mean the first floor vs. the second floor or basement area, but the point of burning in any particular room closest to the floor. (Fire generally burns up, not down.)

The point of origin can be a clue to possible arson. For example, if two or more distinct points of origin are found, that means two or more separate fires—an indication of deliberate setting. Also, did the fire start in a place where fires don't normally start—in a closet, perhaps, or in the middle of a large room, away from furniture or other objects? (If the building has been destroyed, you'll need the help of the owner or tenant in reconstructing through diagrams what was located where.)



Once you know the point of origin, the next step is to determine how the fire started—the cause. Even though your eyes already are open for signs of arson, you must not initially assume the fire was in fact arson. You must first investigate all possible accidental or natural (“act of God” type) causes; only after all such causes have been eliminated can you proceed on the assumption that arson occurred. Many courts have held that this elimination of accidental causes is a firm basis for an arson charge. Also, if you are put on the witness stand, you are sure to be asked whether you checked other possible causes. An admission that you did not would substantially weaken the prosecution’s case.

Some of the more common accidental or natural causes of fire fall in the following categories:

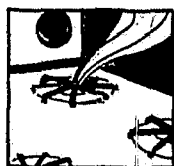
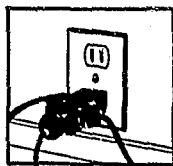
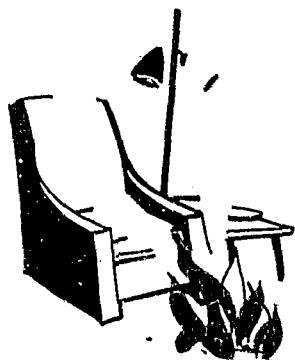
—The electric system. Fuses in which pennies have been inserted; broken or rotted insulation; overloading of circuits; defective switches or fixtures; improperly installed wiring.

—Electrical appliances and equipment. Defective units, overheated irons, light bulbs covered by paper shades.

—Gas. Leaks in pipes or defective stoves or heating units.

—Painting equipment. Carelessness with paint, paint rags, linseed oil, turpentine, other flammable materials.

—Heating Units. Overheated stoves or steam pipes; clothing being dried too close to fireplaces or open flames; faulty



chimneys or flues; explosions from kerosene stoves; space heaters overturned by pets.

—Sunlight. Concentration of sun's rays on bubbles in glass window panes, convex shaving mirrors, odd-shaped bottles.

—Lightning.

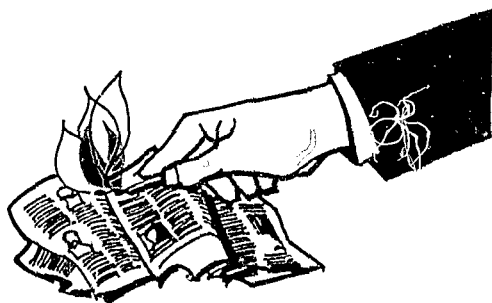
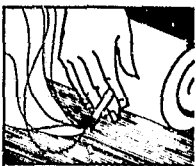
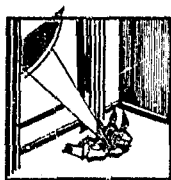
—Children playing with matches.

—Smoking. Careless disposal of cigars, cigarettes, pipe ashes; falling asleep while smoking in bed or chair.

There are, of course, many other less common accidental or natural causes of fire. Which ones you'll look for depend on the point of origin and other circumstances surrounding the specific fire. But if you can rule out all possible accidental or natural causes. . .and, perhaps, you've already detected a few signs that the fire was intentionally set. . .you are then ready to look for positive evidence of arson.

We have already noted some physical evidence signs you may observe *during* the fire: pulled window blinds, forced entry, separate fires, rapid burning, how the fire spreads, a peculiar point of origin. What, exactly, do you look for after the fire?

First, you need to know something about fire-setting mechanisms. An arsonist may use the simplest of methods, a match and some paper; or he may use elaborate mechanical or chemical means to start his fire and keep it going. A fire-setting mechanism consists of an ignition device, possibly a



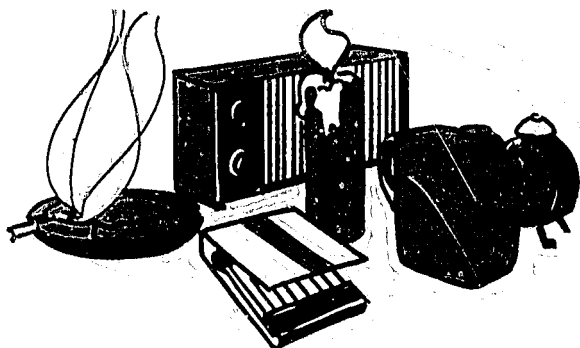
timing mechanism; one or more "plants"—newspapers, excelsior, wood shavings, or other materials—to feed the initial flame; and often "trailers" to spread the fire—sometimes from plant to plant.

Trailers are often used along with gasoline, kerosene and other fluid accelerants—favorite tools of the arsonist. Rags, newspapers, rope or toilet paper soaked with gasoline are examples of trailers. . . or gasoline by itself may be used. Solid materials may leave residue. You may be able to trace gasoline and other fluid materials from the point of spillage to the lowest point they reach. Often unburned quantities of the fluid may be found in rooms below the fire, in cellars, or in the foundation. Sometimes fluids form a pool and burn toward the center of it, leaving a distinctive mark on the floor.

Here are some other fire-setting mechanisms, and clues they may leave:

—Matches, often used with timing mechanisms to delay the fire so the arsonist has a chance to get away and establish an alibi. Examples are matches attached to lighted cigarettes or hooked to the ringing mechanism in a telephone. Look for unburned or partially burned matches at the fire's point of origin.

—Candles, another delaying device, usually used with con-



tainers of easily combustible materials. They leave a deposit of wax, sometimes soaked into the wood of a floor or found in a pool at the low point of a floor or table top.

—Chemicals. An example would be slow-leaking rubber receptacles filled with water and phosphorus; when the water drains below the level of phosphorus, the chemical ignites on contact with air. Sometimes chemicals that ignite on contact with water—from a thundershower or flushing toilet, for example—are used. Residue or a distinctive odor are clues.

—Leaking gas, as from a stove in a tightly-sealed room. This, of course, leaves an odor.

—Electrical systems. An ignition device may be hooked to doorbell or telephone. An open heater is placed near curtains. There is deliberate overheating of an iron or overloading of a circuit. Generally, some trace of the ignition device will be found.

—Mechanical devices. Limited only by the arsonist's imagination. Alarm clocks wired to some fire-setting device were once a popular tool. Normally, most of the machinery won't burn and will be left over as evidence.

Sometimes what is missing from the fire scene is an even better sign of arson than what is there. Does it appear that much of the building's contents—especially furniture, clothing, valuable and prized items and pets—was removed prior to the fire? Are the refrigerator and freezer empty? If there is an outbuilding untouched by the blaze, look inside it—you may find the missing items, indicating the owner or tenant knew there was going to be a fire.

Any physical evidence you find must be carefully documented and preserved. For example, if a piece of debris contains gasoline, put it in an air-tight container for later analysis; note on the label who found it, where (exact location in building), the date and time, and any witnesses present. Photographs should be taken, preferably by a professional photographer who knows what types of photos would be admissible and useful in court. But even a mediocre photo taken by an amateur is better than none at all.

**3. Catching...  
and convicting...  
the arsonist.**



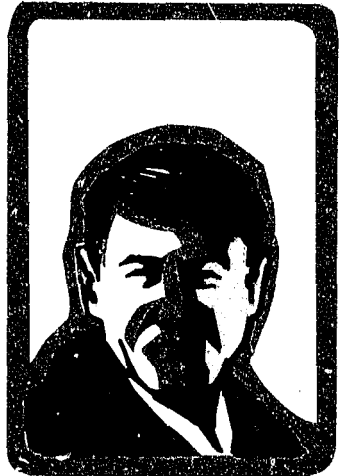
**Y**ou have now determined the cause of the fire: It was arson, and you know exactly how it was set. In many cities and villages, the local fireman's job would end right here; further investigation would be left to either the police or to the state or provincial arson investigation agency. But in some large cities, especially where the fire department has an arson unit, firemen would continue the investigation. This section is intended for firemen who would be expected to go beyond finding out how the fire started.

Now that you have pinpointed the "how" of the fire, your next task is to determine the "why" and the "who." Why was the fire set, and who set it? You begin by attempting to discover a possible motive for the fire. Behind almost every arson fire there is a motive—a reason for its occurrence—although it may not always be "reasonable." Once you establish a motive, you often come up with a suspect or list of suspects.

Among the "rational" motives for arson are: profit (accomplished through insurance fraud); other financial gain; revenge, attainment of a goal or promotion of a cause (fire resulting from labor trouble, racial or religious strife); concealment of another criminal act, such as murder or burglary; and intimidation. "Irrational" arson fires include those set by pyromaniacs, vandals, juveniles and other thrill-seekers.

"Burning for profit" is probably the most common arson motive. Under normal circumstances, a homeowner doesn't burn down his own home, nor does a businessman destroy his own business. But when trouble comes—especially serious financial trouble—a normally law-abiding citizen may see arson to collect insurance money as the easy way out of his problems.

You find out whether this may have been the case by asking a lot of questions—of the home or business owner, neighbors,



business associates, competitors, anyone else who might have information—and sometimes by studying public records, such as those found in a courthouse. Any number of facts may be possible motives for insurance fraud, but here are some of the most common signs:

—The business owner is unable to meet certain financial obligations: mortgage payments, taxes, rent, wages, notes payable, accounts past due, insurance premiums.

—Owner no longer wants the property and can't sell it.

—Owner wants to liquidate business quickly, or dissolve a partnership.

—Too high an inventory and absence of ready market for stock. Obsolete merchandise. Seasonal business at an end. Orders from jobbers unexpectedly cancelled and manufacturer unable to dispose of merchandise.

—Poor business conditions in general. Inexperienced management cannot run business properly. Business quarters outgrown. Desire to move from a certain location.

—Owner has urgent need for ready cash to start fresh in business or pay pressing obligations.

—Property is grossly over-insured, or insurance on it has recently been substantially increased.

—Householder is having marital problems, or needs money to pay hospital bills, attorney's fees, other large bills.

—Homeowner has a history of fires in other residences.

—Land is being sold and building is to be removed as condition of sale.

Sometimes the person whose property is insured is innocent of any wrongdoing, but someone else stands to gain financially from the burning of it. For example: A competitor wants to put the property owner out of business; a contractor wants to boost his own business; a tenant wants to break an undesirable lease.



"Spite" fires may be related to the arsonist's job—arising in the midst of a strike, or because someone is angry with a former boss who fired him—or to his personal life—jealousy over a love rival, for example. Arson for racial, religious or political reasons may be an outgrowth of a riot or other disturbance. Perhaps a careful sifting of the fire remains reveals another crime—anything from murder to attempted destruction of records to conceal embezzlement.

Where no motive is apparent, you may suspect the fire was set by a pyromaniac or perhaps by a juvenile thrill-seeker. How and where the fire was set may serve to confirm your suspicions. If it was set in part of a building readily accessible to the public, that's typical of a pyromaniac or juvenile; he wants to make a quick entry and a fast exit. Also, if the arson "plant" was simple—a few twists of newspaper or some rubbish ignited with a match—odds are it wasn't devised by someone with a "rational" motive; the preparations would have been more elaborate.

The pyromaniac, as we noted earlier, often sticks around to watch the fire, or offers to "help" the firemen, or questions them extensively about the fire's cause, or appears to be the "hero" who discovered and reported the fire. In other words, he may give himself away—especially if there is a series of fires and he's there right after each one.

Of course, the fact that someone may have had a motive to set a fire doesn't necessarily mean he did it. The prosecutor must show that the accused arsonist not only had a motive—perhaps one stronger than that of anyone else—but also had an **opportunity** to set the fire. And, if possible, he also should present evidence linking the accused person with the fire: for example, the building was locked up and only he had a key.

Many persons may have had an opportunity to start the fire, but your field of suspects will narrow when possible motives

are considered, and it will be further narrowed when these motives are related to the background, personal characteristics, past activities and financial status of each suspect. Ten persons may have had a chance to set a fire, but only four or five had good reasons for wanting it. And of these, only one or two would risk an arson conviction for the expected profit or satisfaction to be gained from their act.

In probing an arson fire, seldom will you uncover **direct** evidence linking a suspect with the blaze. An example of direct evidence would be a witness testifying he saw the suspect bend down, strike a match and set the building on fire. Arson is a crime of stealth, and the guilty person is seldom caught in the act. What you probably will concentrate on gathering is **circumstantial** evidence—provable facts taken together from which a conclusion may be inferred. For example: You know the fire was ignited by a timing device triggered two hours before the fire actually started. You know Mr. Jones has an alibi for the time of the fire, but not for two hours beforehand. You know Mr. Jones is the only person who could have had access to the building at that time. Therefore, Mr. Jones set the fire. Contrary to popular opinion, circumstantial evidence is not necessarily inferior to direct evidence. In fact, it may be more reliable, since it usually requires a large number of witnesses and it's unlikely they would all lie in court; it's more plausible that a single witness might lie about direct evidence.

It would be difficult to draw a compact set of guidelines on precisely how to go about conducting an arson investigation. Each case is different, and the questions you ask will depend on the circumstances. But if one general hint applies to all cases, it's this: Get people talking, then **listen**. Too often, investigators talk more than they listen. When a person is talking, regardless of the subject, he may furnish vital information

or evidence. **Let him talk**—about anything—and sooner or later the conversation will get around to the subject at hand. Be especially attentive to neighbors, friends and business associates of the building's owner; one of them may have heard him contemplate a fire. And, especially in critical stages of your investigation, get statements in writing or on tape; verbal statements are subject to change.



## **4. Training: how to get it.**

This booklet has been designed to give you an overview of the arson problem and some basic advice on how to determine the cause of a fire and conduct an investigation. To be a really effective investigator, however, you need more detailed information and more extensive training than you can get from simply reading a booklet. You need to take advantage of one of the many arson investigation courses available to firemen in Illinois.

These seminars are held at various locations throughout Illinois during most seasons of the year. In most cases, local fire departments are notified of them well in advance of the scheduled dates. For information on upcoming seminars, you or your fire chief may want to contact the Arson Bureau of the Illinois Department of Law Enforcement, 188 Industrial Drive, Room 18, Elmhurst, Illinois 60126, phone 312-530-3605.

The University of Illinois conducts an annual firemen's training course that includes an optional section on arson; all fire departments are notified as to the dates and other details of this course. Most of the state's junior colleges offer fire science courses, many of which cover arson. You should contact your local or area junior college for details on their program.

The Illinois Fire Training Commission provides financial assistance to cities and villages that send firemen to many of these seminars and courses. Expenses of firemen, including their salaries while attending the training sessions, are reimbursed on a 50-50 basis. Seminars and courses are approved by the commission on an individual basis, so you should contact your chief or the sponsoring organization to find out if financial aid is available for a particular seminar.

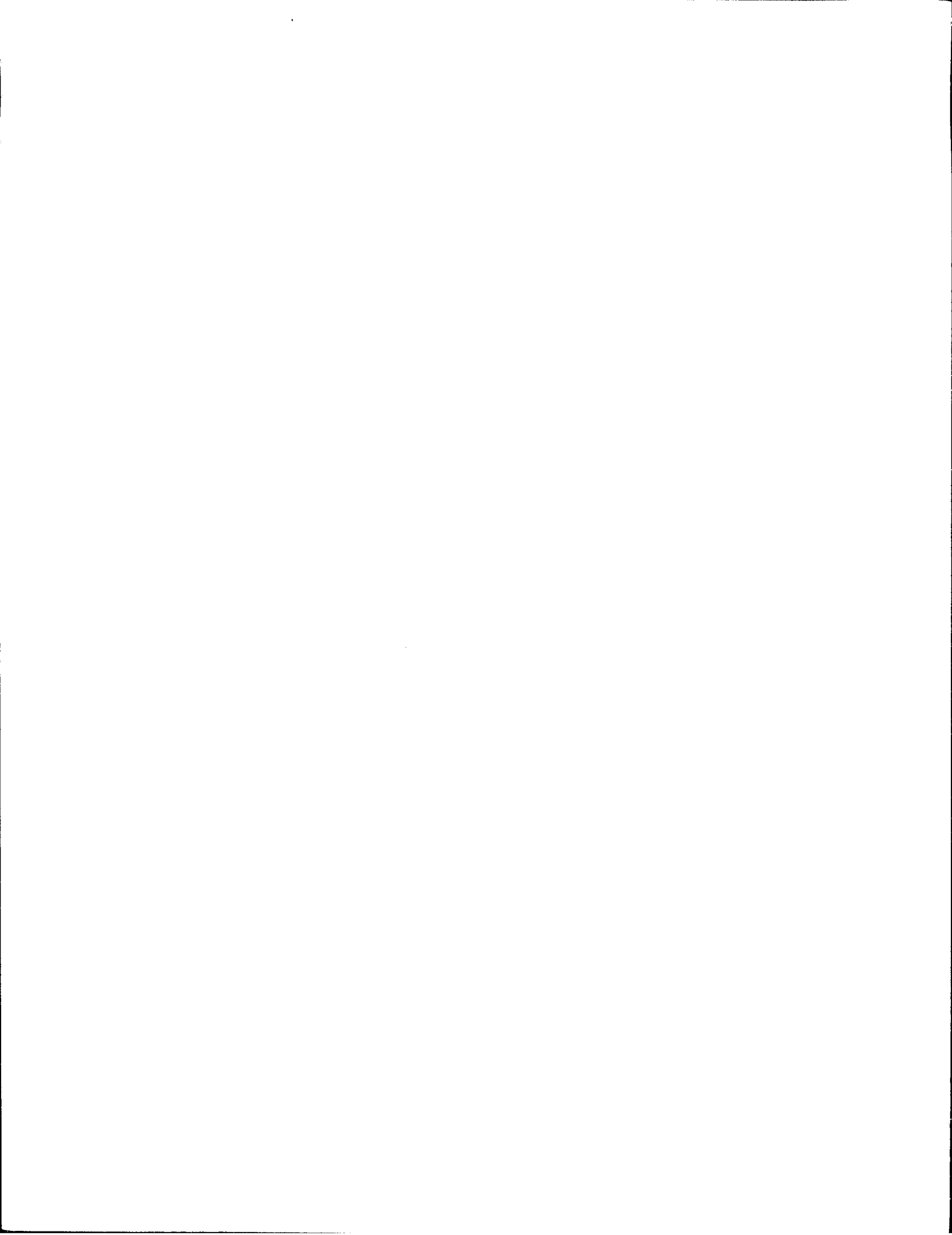
As a fireman, you have a personal stake in reducing the frequency of arson: fewer fires mean less risk of life and limb on the job. But you also have the interest of any citizen in cutting down on arson: less serious crime, lower loss of life and property, and less waste of your insurance premiums on paying off those who "burn for profit." You can be a key,

front-line soldier in the battle against arson—if you'll take a few days to get the training you need to recognize it, investigate it, and help bring the criminal fire-setter to trial.

**This booklet is published by the Illinois Advisory Committee  
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