

HOMICIDE INVESTIGATION

A Practical Handbook

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converted by

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INTRODUCTION

Homicide has been increasing during the last several decades. According to statistics gathered by the Federal Bureau of Investigation and published yearly in its Uniform Crime Reports (UCR), 1960 saw 9,110 non-negligent homicides. There were 9,960 in 1965, but the population had increased, and the rate of 5.1 per 100,000 people remained the same as five years earlier. In 1970, there were 16,000 homicides, for a rate of 7.9 per 100,000 population. The number and rate jumped again to 21,460 in 1979, giving a rate of 9.7. There has been a recent decline, and in 1987 there were 20,096 homicides, for a rate of 8.3.

Homicides number less than suicides. In 1978, there were 27,294 suicides, for a rate of 12.5 per 100,000 people. This is far more than the homicide rate has ever been. However, suicide is not illegal, and homicide is.

This book is for police officers and civilians alike. It's an investigatory guide and practical manual for the police officer charged with a homicide investigation and its follow-up. For the civilian, including the police department's civilian superiors, it provides a comprehensive working knowledge of how police investigators conduct homicide investigations. Very importantly, it provides a basis for appraising the chances of apprehending the perpetrator and lays out steps to enhance the odds.

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Those of you who have read other books in the Loompanics Criminal Justice Series may have noted that we approach the topics somewhat differently from other texts. We'll cover this topic in the following order:

TASKS

TACTICS

TOOLS

The reason is that this is the logical way to do it. We need to know the extent of the problems facing us before we can decide on how to handle them. Consequently, we first lay out the tasks. Once we know the tasks, we can choose and discuss the tactics which are most effective. Knowing the tactics, we'll be able to select the tools for the job.

TASKS will cover the nature of the problem, including the definition and extent of the crime. We'll look at the perpetrators, their various types and categories, and how they commit homicide. We'll study their techniques and motives. We'll also discuss how death comes about, and what happens to the body after death.

TACTICS will cover the police response to homicides, including the first officer on the scene, and the work of the homicide investigator. This will include processing the scene for clues, obtaining statements from witnesses, and follow-up procedures. We'll also get into pro-active policing, the setting up of "sting" operations and the offensive against killers for hire.

The emphasis will be on practical tactics, not legal theory. Laws vary from state to state, a symptom of the fragmenting of American policing. Subtle legal points valid in one jurisdiction don't apply the same way, or perhaps don't apply at all, in the next.

In a homicide investigation, practical opportunism is the key to progress because the opportunities are fleeting. Evidence can disappear, as can witnesses. Suspects may confess spontaneously,

then retract their statements. A victim who identifies his killer before dying will be unavailable for further statements after death. This is why it's vital for the investigator who is in doubt about a subtle point of procedure to act immediately, as he may not get another chance. This is not a justification for incompetence or for slipshod work, but simple recognition that it's better to take a chance to obtain and record evidence than to face the certainty of it slipping away. An example is the "dying declaration." There are specific legal requirements for a dying declaration to be valid and admissible. While we'd all agree that officers should be adequately trained, the officer who doesn't have training in dying declarations should not refuse to take one, because the opportunity will not come again.

TOOLS will cover specific items of equipment and their use in the investigations. We'll resist the temptation to make this another "police gun book" and try to restrict the discussion to other equipment that's specifically suited for the specialized investigation.

This book will also deal with controversial topics in homicide investigation, topics largely ignored in other texts. For example, we'll look at the "misdemeanor murder" and at vigilante killings. These are hot potatoes, and often reflect badly upon the police agency in whose jurisdiction they occur. We'll also examine some aspects of handling informers, and methods used to pay them. Some, such as paying them in drugs, are illegal, but can produce results. This is why some police investigators do it. This book will concentrate on the way things are, not the way they should be.

The opinions of behavioral scientists, such as psychologists, psychiatrists, and social workers, also play a part in these discussions. There won't be much emphasis on them, though, because they're mostly contradictory and unfounded. Ask three different psychologists and you get three different opinions. Psychiatrists come out of the woodwork to testify at trials, each

group of psychiatrists spewing out the opinion that suits the needs of the party paying its fees. When a bizarre murder occurs, we find psychiatrists and psychologists holding forth in the media even before the killer is in custody, providing diagnoses of people whom they never met.

This book is oriented towards the small department officer, because small police departments comprise the majority of police agencies in this country. Large agencies have many talented and highly specialized officers, each with his own function, but officers in small agencies must be more versatile and self-reliant. We'll sometimes refer to the investigator as the "homicide investigator," even though the investigator in a small department can't specialize.

One final word: Despite the trendy non-sexist writing we see these days, we'll be referring to the victims and suspects as "he" and "him" in this book, except when the person must be female. In fact, most murder victims, and most murderers, are still male. Women's Liberation has not quite caught up in the criminal sphere. As a practical matter, it's easier to write and to read "he" than "he or she."

PART I: TASKS

A FIRST LOOK AT HOMICIDE

Homicide is a catch-all term meaning "the killing of a person," whether justified, accidental, or felonious. We won't spend much time on the legal definitions of each type, because laws vary from state to state, and court decisions are constantly changing the details. Instead, we'll categorize and examine homicides according to motives and techniques, as these are far more useful in determining the chances of apprehending the killer.

LEGAL DEFINITIONS

Justifiable homicide is one which is allowed by law. This includes killing in self-defense, and killing to prevent the escape of a felon by a police or correctional officer. Some states allow using deadly force to prevent or stop a felony, and the exact listing of felonies allowed under this category depends upon the state. Most states do not allow killing by a civilian to prevent escape of a felon. Citizens can use deadly force to protect themselves or a third party against a serious attack, but if the felon turns and runs, they no longer have the right to use deadly force.

Accidental killing can occur in several ways, and some of these can be indictable. Killing with a motor vehicle can be very

serious, especially if the driver is legally under the influence of alcohol or another drug, or if the investigating officer can show negligence.

Felonious killing can be premeditated (First-Degree), or impulsive (Second-Degree). An impulsive killing can also be manslaughter, depending on the law in a particular jurisdiction. A suicide can involve a felony, although no state has a statute to punish suicide. However, assisting someone in a suicide attempt is often illegal. There may also be an attempt to make a suicide appear as something else, if an insurance policy applies which does not pay off for suicide.

The amount of premeditation varies under both statute and case law. In some cases, there must be a well-thought out plan, and an intent before coming on the scene. In other cases, simply leaving the room to get a weapon serves as evidence of premeditation. The "felony-murder" law covers killings incidental to commission of a felony, such as killing during a robbery. Most states have such a law, to cover instances of deaths that the felon may claim were accidental or unintentional, but which occurred during a felony or its aftermath.

HOMICIDE STATISTICS

According to the FBI's Uniform Crime Report for 1987, there were 20,096 homicides that year, for a national rate of 8.3 per 100,000 population. Homicides are not evenly distributed throughout our country, or our population. The Southern states have the highest homicide rate, 10 per 100,000 population. The rate in the Western states is 9 per 100,000, and in the Northeastern and Midwestern states it drops to 7 per 100,000.

73.7% of homicide victims are male. So are most killers. 84% of male victims are killed by other males. 90% of female victims are killed by males.

52% of victims are Caucasian. Most are relatively young, under age 40.

Of 1987's identified killers, 4,957 were white. 5,015 were black. Murder tends to remain within racial lines. 94% of blacks murdered were killed by other blacks. 88% of whites fell victim to other whites. Murder tends to be a young person's crime. 44% of those arrested were under 25.

Homicides tend to peak during August and December. The difference in rates between those and other months is not great, however.

Firearms played a role in 59% of the homicides. Cutting and stabbing weapons took second place, at 20%.

In 17% of the cases, killer and victim were related. They were acquainted in 40% of the cases reported. Not surprisingly, arguments formed the largest group of precipitating causes, 39.6%. Other situations were far less frequent.

Let's now look at the types of homicides:

TYPES OF HOMICIDES

We have to consider many different types of homicides because the investigative methods and the chances of clearing the case will vary with the type, although they fit into very few categories under the law. Let's note that these categories often overlap, because the dividing lines are much easier to draw on paper than in real life. Motives for murder vary greatly, and often directly affect the method and the circumstances.

Murder For Profit

This type of murder can be with a linking motive, or without one. A person who kills another for an inheritance has a clearly linking motive, and the investigator has a head start in finding it because the killer knows his victim.

Robberies formed 10.6% of murders reported during 1987. An armed robber who kills a stranger during a robbery does not show a motive that directly links him to the victim. This is the sort of impersonal killing that's much harder to solve than the other type, because the perpetrator is a street-smart career criminal who knows how to evade apprehension.

Self-Protective Murder

This is a murder to eliminate a damaging witness, to silence a blackmailer, or to neutralize an extortionist. The robber who kills his victim is an example. The person who kills another who has damaging information about him is another. Some of these cases have obviously linking motives. Others do not.

Revenge Murder

Reprisal for a real or imagined wrong is another common motive. Marital infidelity is one possibility. Former employees sometimes kill their employers for what they feel are unjust dismissals. Revenge provides a linking motive for the investigator in most cases.

The exceptions are the truly imaginary wrongs, such as resulting from psychotic delusions. In many cases killer and victim don't know each other, because the motive is only in the killer's mind. At times, victim and killer are slightly acquainted, but no linking motive is apparent to the investigator. One example might be a man who kills a female co-worker who refused an offer of a "date." We have to classify these as "psycho" murders.

A revenge killing may be impulsive or premeditated. Either way, the linking motive is there for the investigator to uncover. However, if the person with the grievance has not committed the crime personally, it may be extremely difficult to get an indictment, much less a conviction. If a contract killer was involved, it's almost impossible.

Contract Killing

This is one of the most difficult types to solve, because the killing is done by a professional, and the person hiring the killer makes sure to have an alibi. Indeed, the instigator may be in a different city several states away. The motive may be revenge, deterrence of informers, or to get an inconvenient obstacle out of the way.

One morning in April, 1974, Joseph Bombacino started his Lincoln Continental and started backing out of the parking slot behind his apartment. When he applied the brake, a detonator wired to the brake light set off an explosive charge and blew him and pieces of his car into orbit.¹ Bombacino had been under protection of the Federal Witness Program, but mobsters had traced him and sent a contract killer to eliminate him. The murder remains unsolved.

Political Assassination

This can be of a visiting V.I.P., or a politically active resident of the community. The V.I.P. typically has so many bodyguards and local officers working the outer perimeter that it's very difficult for the assassin to carry out his act and to escape. Investigating officers can expect much help from state and/or federal agencies, especially if the victim is a government official. Indeed, they may even "take over" the case.

The local political activist may be an officer of a social or political organization, unable to afford a staff of bodyguards. His attacker has a much better chance of escape. State and federal agencies may offer help, especially if the victim is well-known.

Suicide Compact

This is the result of an agreement between two parties to end their lives. At times, they don't mutually commit suicide, but agree to have one kill the other before taking his life. The victims

may be teen-agers, following a fad, or old people with failing health. Occasionally, one partner may be healthy but does not want to continue living without the other. Prescription drug overdoses are often involved in this type of arrangement, and those planning mutual suicides often obtain prescriptions for sleeping pills from doctors and save them for the event.

It's important to distinguish this pattern from the murder-suicide sequence, in which the killer murders his victim without consent, and takes his own life afterwards.

Drug Burns

Drug dealers often try to "rip off" the people with whom they deal, instead of making honest deals. This is why many go armed, especially when a deal "comes down." If there's a disagreement over the price or terms, a deadly encounter can result. Officers finding a body in an isolated place, with no witnesses, have to consider a bad drug deal as a possibility. Drug murders formed 2% of those reported to the FBI during 1987.

Investigating officers need to work closely with the narcotics unit in such a case. The "narcs" are more likely to know the victim's associates, his standing in the drug world, and whether anyone had a motive for revenge.

Gang Murders

Juvenile gang murders have always been with us, but are more common today. One reason is that street gangs are no longer exclusively juvenile, but have adult members. Another reason is that street gangs often get into serious crime, such as drug trafficking, and consequently motives other than territorial ones enter the picture. Yet another reason is intangible: street gang members are more casual about violence today. Indeed, it's become a vital part of the culture, and in some street gangs a candidate cannot attain full membership until he kills "in the line of duty."

Vigilante Actions

"Vigilante" is the dirty word in American policing. The existence of vigilantes, whether groups or individuals, implies that the official police are not effective. Vigilantes have no legal standing, and police and prosecutors cannot treat them as auxiliary police, or provide them with any kind of help. Rather, they seek to suppress vigilantes whenever they can. More often, they try to ignore them and pretend they don't exist. If the vigilantes are discreet, this policy can be successful.

The occasional individual, driven by rage or grief, who kills a person suspected or convicted of a crime, often doesn't try to hide it. Jack Ruby, who killed Lee Harvey Oswald, was one. The father who shot Jeffrey Doucette, the person who allegedly molested his daughter, was another. The pharmacist, Charles Jones, who shot and killed the man who allegedly beat his grandson to death was a third. All shot the suspects in public places, and were apprehended on the spot.² Making the case and securing a conviction is not difficult. However, because of obvious sympathy, offenders often don't get heavy sentences.

Some vigilante groups are almost non-violent, acting to deter crimes by their presence. New York City's "Guardian Angels" are one such group, patrolling the subways to combat muggers. They travel unarmed, depending on their numbers and tactics to deter or combat violence.

In certain drug-infested neighborhoods, some parents band together to rid their immediate areas of drug dealers. They ambush the dealers and kill them, leaving the bodies to be discovered by the police. Police officers who come upon such corpses have no way to determine whether the victims were involved in drug burns or were killed by vigilantes.³

Vigilante killings are probably increasing. There's no reason to believe that their number will decline in the near future. Citizens who have committed vigilante actions that did not result

in death have stepped forward to admit them, pled self-defense, and been acquitted after a trial.⁴ Those who killed during vigilante actions usually find that police investigators don't pursue them vigorously because their victims are known criminals.

Impulsive Murder: Crime Of Passion

This is the second-degree murder committed in a blind rage. Typically, the killer and victim are related or acquainted, and the linking motive is clear. Often, this crime occurs in front of witnesses, which simplifies the investigator's problems. Arguments were the precipitating cause in 39.6% of all murders reported in 1987.⁵

A killing of this type can also be unintentional. A victim, engaged in mutual combat, who falls down and strikes his head on a hard surface can die from the impact. In such a case, his opponent may be able to plead to a lesser charge, such as manslaughter.

"Psycho" Murders

This is an extraordinarily difficult type of murder to solve, the main reason being that usually there's no evident connection between the perpetrator and the victim. Under this category we'll lump the serial killer and the sex murderer. While there are some psychotics who kill friends and acquaintances, the difficult "psycho" murderers kill strangers, perhaps because voices tell them to do so.

This category overlaps with that of the "serial killer," who is often nomadic and commits a string of murders in several states. Theodore Bundy is one example. Some serial killers used to be labeled "thrill killers" by the media because they had no apparent motive for killing their victims. Charlie Starkweather, of Nebraska, was one of these.

Serial killers cannot be severe psychotics, because they need enough presence of mind to support themselves, plan their killings and get-aways, and travel unnoticed around the country. Some serial killers, such as John Wayne Gacy, are successful businessmen who support themselves and direct their companies for years, killing all the while. As a rule, the serial killer who stays in place runs a greater risk of apprehension, simply because as the bodies pile up, police become aware of his activities. There are also collateral traces, such as an increasing number of missing persons, which may alert the police.

Another type of killing which belongs under the "psycho" label is the "satanic" or "ritualistic" murder. This is the result of satanic followers putting their creed into practice. Although this type of activity has gotten a lot of recent media attention, it's very rare.

At times, suicides are attributed to satanism. The recent suicides of three Navajo teen-agers on their Arizona reservation was allegedly a result of a satanic cult.⁶ The victims had the numbers "666" burned into their skins. This is allegedly a sign of devil worship.

Sexual Homicides

Sex murders are rare, comprising only 16% of homicides reported to the FBI during 1987. This category takes in a variety of sexually-related acts. What determines a sexual homicide is that sexual pleasure is the main component. The killer derives sexual pleasure from inflicting pain, or from taking life. Killing a rape victim to prevent her from identifying her assailant belongs in another category.

There are sexual sadists who enjoy inflicting pain so much that they'll commit a felony for pleasure. In this regard, it's important to understand the definition of "sadist." A sadist is a person who gets sexual pleasure from causing pain. Many people mis-use the word to denote someone who is merely cruel.

Sadists, however gruesome the crime, aren't necessarily psychotic, as the planning required precludes a totally deteriorated personality. People who commit sexual murders are often self-supporting and run their lives normally while indulging their perverted passion on the side.

Another type of sexual homicide is the masturbation-related strangling. This is a form of accidental suicide. Some masturbators use a noose to constrict the blood vessels in their neck. The partial loss of consciousness heightens sexual pleasure for them, but some lose consciousness totally and strangle themselves.

Homosexual-Related Murder

This is what used to be known as a "fag murder." It is, strictly speaking, a crime of passion. It comes about when a homosexual tries to pick up a heterosexual who feels threatened by the advance and becomes violent. Typically, the pick-up occurs in a bar, toilet, or other public or semi-public place, but the proposition may not occur until later. The killer may not intend to kill his victim, but death occurs incidental to a severe beating. If the killer intends to kill his victim, there are often many blows or stab wounds, because homosexual killers tend towards "overkill."

A variant on this theme comes about with male prostitutes. Some are under-age, and try to blackmail their clients, threatening to report them to the police. This can drive a person who is secretly homosexual into a panic because it can spoil an otherwise respectable life-style. The reaction to this threat may be quite violent, and can result in the blackmailer's death.

Yet another variant is the "fairy hawk." This is the older male who preys upon young male prostitutes, luring them to an isolated spot where he rapes or robs them. This sort of encounter can turn out either way. The predator may overpower his victim. Young male prostitutes, however, are aware of this danger, and some arm themselves so that they may resist a fairy hawk. If the

fairly hawk survives, he may be reluctant to press charges, especially if he has priors of a sexual nature. If he's killed, clearing the case may be exceptionally difficult, especially in a large city with many homosexual prostitutes.

Victim-Induced Homicide

This is a fairly recent category, because during the last couple of decades there's been recognition by behavioral scientists that some people are abrasive to the point of being self-destructive. One example of a victim-induced homicide comes about when the victim, in a bar, begins bragging about the size of his paycheck, and making unfavorable comparisons with another drinker's paycheck. Sooner or later, he'll provoke someone to violence.

It's important to stress that the victim-induced homicide is not a novel Twentieth-Century category. It's always been with us, and many experienced bartenders and police officers know that certain people seem to pick fights with almost anyone, anywhere. However, official recognition in professional publications has rarely hinged on the observations of street cops and bartenders, however accurate they may be.

CLEARANCE RATES

Clearance rates for murder are lower today than they were years ago. During the first half of the century, the clearance rate was typically in the mid-90s. In 1960, it had fallen slightly to 92.3%. The clearance rate for homicide in 1976 was 79%. By 1982, the clearance rate for homicides had dropped to 73%.⁷ The clearance rate for 1987 homicides was 70%, according to the FBI.

This statistical trend may seem strange to anyone aware of the more effective modern methods of evidence gathering and processing, but the basic reason lies in standards of crime reporting. Several decades ago, police officers finding a body had

greater discretion in reporting and handling the incident that they do today. Some officers reported certain homicides as "unfounded" and reassigned them as accidental or natural deaths. This was possible because no jurisdictions required autopsies on all mysterious deaths. The decision regarding whether or not to call out the homicide squad was very much that of the patrol officer who came upon the scene.

Clearance rates are an important measure of police effectiveness. A detective knows that if his clearance rate is much below average for the type of crime to which he's assigned, it will reflect badly on him. Likewise, a police chief knows that a newspaper headline that reads: "250 UNSOLVED MURDERS THIS YEAR" places him and his department in a bad light. Years ago, patrol officers knew that if they reported certain types of unsolvable murders as such, the detectives in their precincts would be angry at them for cluttering their files with crimes they couldn't clear. This led to the concept of the "misdemeanor murder." The "misdemeanor murder" came about in certain Eastern cities because dead bodies were embarrassments to investigating detectives. Patrol officers finding bodies were often able to gloss over the mode of death because reporting requirements in those days were frankly sloppy. A patrol officer could report a stabbing as "accidental," leading to the joke, "He ran around the corner, tripped, and fell on his knife seventeen times."

It was also convenient to report a drug overdose as a "heart attack," even though the patrol officer had no medical qualifications to make the diagnosis. Likewise, a bludgeoning could pass for injuries received during an accidental fall. These were all ways to keep the reported murder rate down by assigning other causes to the deaths.

A classic homicide investigation text of a generation ago, written by Soderman and O'Connell, estimated that only about one in ten murders is even recognized as such by the police.

Soderman and O'Connell were very experienced homicide investigators of the old school, when reporting procedures on all crimes were sloppy, even in the big cities.

When New York City tightened up its reporting requirements in the middle 1960s, the rates for all crimes went up suddenly. The number of unsolved cases also rose. Police officers had less discretion in deciding to write paper on an incident

Another modern practice has been to legislate autopsies for all deaths not covered by a doctor's death certificate. This, and a tightening up of qualifications for those allowed to perform autopsies, has uncovered murders that would have passed unreported before.

Changing the traditional "coroner" system to one requiring examination by a forensic pathologist has eliminated some administrative sloppiness in death reporting. Previously, the law allowed a quick examination by a local physician, often a general practitioner, and his opinion contributed to the verdict rendered by the "coroner's jury," a group of laymen who would decide upon the cause of death.

The odds of clearing a murder depend very much upon quick action by police officers. Experienced investigators know that if they're going to apprehend the perpetrator, they'll most likely do it within the first 48 hours after the murder. Two reasons contribute to this:

1. In many murders, killer and victim know each other, and a linking motive points the way for investigators.
2. Physical evidence needed to "make" the case becomes stale very quickly. If there isn't a maximum effort to gather and process evidence quickly, it disappears. With time, it becomes more difficult to determine blood type, or even whether a stain is blood at all. With time, the trail grows cold.

Physical evidence is important in homicide investigations, as it is in other major crimes. Although many criminal investigators

tend to under-value physical evidence because of their successes with informers, an objective study published in 1984 by the National Institute of Justice found that gathering physical evidence results in higher clearance rates in robberies and burglaries.⁸ The study compared cases collected from four major jurisdictions, focusing on clearance rates vs. physical evidence collection. Comparing cases of burglary, aggravated assault, and robbery in which there was collection of physical evidence with those in which there was not showed that physical evidence boosts clearance rates.

There were no comparisons for homicides because homicides are major cases and there's a serious effort to gather physical evidence in all homicides. This left no control group for a scientific comparison. However, it's reasonable to assume that the results transfer over between various categories of crimes because many techniques of investigation are the same, regardless of the offense. Simply put, a fingerprint on a weapon links the suspect with the weapon, whether the victim dies or not.

This is why there will be a strong emphasis on physical evidence in this text. Physical evidence, when competently gathered and processed, often makes a difference.

THE BALANCE POINT

Right now, the homicide investigation picture is changing. On one hand, we have more murders reported and a lower clearance rate. The other side is a plethora of new and sophisticated investigative techniques which may overcome many of the handicaps police now face. As well see, new information management systems can make a dent in the problems of single fingerprints and serial killers. The growing use of "DNA Fingerprinting," a new technique, enables unequivocal individual identification from biological samples. Only the

future will tell how new police science methods will affect the crime picture overall.

SOURCES

1. Methods Of Disguise, John Sample, Port Townsend, WA, Loompanics Unlimited, 1984, pp. 104-105.
2. Vigilante, Right or Wrong, HBO Special, 1987.
3. Vigilante Handbook, Victor Santoro, Comville, AZ, Desert Publications, 1981, pp. 47-48.
4. New York Times, October 21, 1988. Two fathers of families in Detroit burned down a "crack house" after being told by the police that they could not do anything until "something bad happened."
5. Uniform Crime Report, 1987, Federal Bureau of Investigation.
6. Arizona Republic, Phoenix, AZ, November 27, 1988.
7. Sourcebook of Criminal Justice Statistics, 1982, Department of Justice.
8. Forensic Evidence and the Police, National Institute of Justice Research report, Washington, DC, U. S. Department of Justice, 1984.

INVESTIGATION GOALS

Investigation into a homicide can be simple or complex, depending upon the circumstances. If the case is definitely a suicide, follow-up is often much simpler than with a murder. As we've seen, most homicides are fairly simple, and the investigating officer's main goal is to preserve the evidence for a prosecution.

An investigation proceeds in chronological order, and in the Tactics section we'll explore the details of the investigation. Right now, let's note that it can proceed in a pattern much like the branches of a tree. At the outset, there are so many possibilities that the investigator must remain alert to all of them, or at least receptive enough to explore the possibilities that appear. Later on, he can narrow his focus by eliminating the unlikely aspects, and concentrate on the most promising avenues of investigation.

Let's outline the vital goals of a homicide investigation, and arrange them into a pattern. While it won't always be possible to work a case in this sequence, it will serve as a checklist for the investigator.

- Preserve the crime scene and gather physical evidence.
- Establish the victim's identity.
- Determine the cause of death.

- Determine the time of death.
- Find and interview witnesses.
- Attempt to reconstruct the victim's final day or final hours.
- Establish the identity of the suspect(s), if any.
- Locate the suspect(s).
- Arrest the suspect(s) and prepare the case for prosecution.

AGENTS OF DEATH

We have to consider both homicide and suicide in discussing the ways people die. The homicide investigator rolls out on dead body calls, even when it's not clear that there's been a felonious assault, because it's safer to use the worst-case assumption.

WHAT IS DEATH?

According to the latest scientific definition, death is cessation of brain activity. "Brain dead" means truly dead, beyond hope of resuscitation. Bringing this about is complex, and can involve assaults upon many body systems. To kill, it's necessary to stop or severely injure the respiratory, circulatory, or central nervous system. In some cases, a violent assault damages more than one system.

Let's work our way through the various means of inflicting death, taking the more common ones first.

SHOOTING

Gunshot wounds account for the greatest number of homicides. A bullet wound causes damage by piercing an organ and destroying tissue in its way. If it's a vital organ, that can be

enough to kill. Puncturing a large blood vessel can cause death by a secondary effect, loss of blood. It's possible to bleed to death in only a couple of minutes. It can also take much longer.

The discussion of a bullet's lethal power is different from the "stopping power" discussions that seem to occupy so many pages in popular gun magazines. A bullet can kill a second after impact, an hour, or even a day or longer, and still remain the cause of death for the homicide investigator. The suspect is guilty whether his victim dies of blood loss on the spot or infection several days later.

BulletTrauma

Because bullets aren't as sharp as edged weapons, they depend upon other effects for tissue destruction. One is speed, which results in kinetic energy. Thus, a body struck by a bullet also receives mechanical shock, which can break a bone or do other damage. The hole a bullet drills is the "permanent cavity," and is often smaller than the diameter of the bullet. Human tissue is elastic, and moves out of the bullet's way, closing in after it passes.

One way of increasing the destructive power of a bullet is to design it to expand after impact. This allows the bullet to retain its small caliber and aerodynamic shape while in the weapon and throughout its flight. Upon impact, a soft or hollow point crushes, and bulges outward, with a "mushrooming" effect. This increases the diameter of the projectile, and increases the size of the wound channel.

A bullet that strikes bone can also break off pieces, sending them on their separate tracks through the body as "secondary missiles." This increases total destruction, and can aggravate the wound far beyond what the bullet alone would have caused.

TheTemporaryCavity

Rifle bullets, moving at much more than sonic speeds, also form what is called a "temporary cavity," a shock wave which

mashes tissue not directly in the path of the bullet. The force of the temporary cavity is enough to break bone, even though the bone is untouched by the bullet.¹

The temporary cavity also destroys soft tissue not directly in its path. This effect can be minor, as with muscle tissue, or it can be severe, as when a bullet strikes the liver.

Areas of Special Vulnerability

Certain areas of the body are extraordinarily vulnerable to certain types of bullet wounds. One is the brain, contained in the cranial cavity. A high-velocity bullet penetrating the skull causes a shock wave which results in a "bursting injury."² This causes brain tissue, cranial fluid, and blood to explode outward as the skull bursts open. A lower velocity bullet causes extensive brain tissue damage, even without bursting the skull, because the inside of the skull reflects the shock waves back into the brain. This is why victims so rarely survive brain shots.

Areas of the body with a copious blood supply, such as the lungs, liver, and kidneys, bleed profusely when damaged. This is why a bullet wound in any of these organs is lethal unless promptly treated.

Entrance and Exit Wounds

The homicide investigator must distinguish between entrance and exit wounds. The entrance wound is generally smaller, and has a ring around it where powder residue rubs off the bullet. If the weapon was close, there may be unburned powder grains embedded in the skin or clothing around the hole. Note that clothing can wipe a bullet clean of powder residue. A "contact" wound, with the barrel pressed against the skin, can have an imprint of the muzzle on the skin. Depending on cartridge power, the propellant gas that follows the bullet into the wound may detach and tear up the surrounding skin.

An important exception comes from ricochet hits. A bullet that has ricocheted off another object before striking the victim may be deformed and make a large and irregular entrance hole. A recovered bullet usually shows longitudinal shear marks that suggest a ricochet.

If the weapon's barrel is very close, there will be a ring of soot around the wound.³ This becomes larger and less definite the farther away the muzzle is when the weapon fires. There may also be flame burns of the skin, depending on how heavy the weapon's muzzle flash is. It's impossible to generalize further than this because of the wide variety of weapons, bullets, propellant powders, and cartridges. All of these affect how "clean-burning" the cartridge is, and this has a direct relationship with how much residue there is to deposit in and around the entrance hole.

The exit wound is likely to be larger, with tissue shreds hanging out of it. There may also be bone fragments, and often more blood than around the entrance wound. This is especially true if the wound was caused by an expanding bullet.

Bullets tend to tumble upon striking the victim, and a bullet that enters point-first may very well come out sideways. A bullet that deforms after striking a bone will rip, tear, and shred the rest of the wound channel, including the exit wound.

It's wrong to assume that a bullet always travels in a straight line through the body, and that the exit wound is always directly opposite the entrance wound. A bullet can deflect off a bone, or change direction because of "yaw" as it tumbles its way through the victim.⁴

Site of the Wounds

Bullet wounds received in an altercation are usually from the front. Entrance holes are usually in the chest or abdomen, because the victim is most likely to be facing his attacker and the torso is the largest target. Another notable type of gunshot

wound occurs in the "execution" type slaying. This usually results in one or two bullets fired into the brain, from front, back, or side. If the victim's hands are tied, this is an almost certain sign of an execution killing.

The reason for shooting the victim in the head is that this is the desirable site for a quick kill. Dr. Vincent Di Maio states that, in his experience, 40% of fatal injuries were brain shots.⁵

EDGED WEAPONS

The edged weapon is usually a knife, although axes and other implements have served as weapons. Improvised daggers, such as icepicks and screwdrivers, are sometimes murder weapons.

There are usually two types of attack: stabbing or slashing. The stabbing attack is necessary when the weapon is an icepick or screwdriver, as neither of these can slash. A dagger, on the style of a "commando" knife, can serve for both slashing or stabbing attacks.

The general rule is that a stabbing wound is smaller than the blade which caused it, because skin is elastic. A knife wound is not necessarily neat and clean, as some knife blades have saw-tooth edges. Hunting and fishing knives are like this.

A slashing attack can occur in a fight, or in an execution. Pulling the head back and slashing the throat, severing the windpipe and carotid arteries, is quickly fatal. Fights can result in many slashes on the body, injuries sustained before the fatal wound that ended the fight.

There are also hybrid wounds made with daggers. Several styles of knife fighting teach driving the blade deeply into the body, then pulling it sideways to reach more vulnerable areas and to cut blood vessels along the way.⁶ This results in a wound showing features of both a slashing and stabbing attack.

"Defense wounds" are slashes found on the hands and forearms, resulting from trying to block or grab the attacker's knife. The deepest gashes come from grabbing the blade while the assailant pulls it out of reach.

Occasionally, an assailant will use an axe or a chain saw. Each makes its characteristic large and ghastly wound. Blunt objects can also lacerate the skin if used with enough force. A piece of "rebar" is thin enough to split the skin when swung hard.

BLUNT INJURIES

A club, baton, axe handle, chair leg, or other, similar object can serve as a lethal weapon. While police officers use impact weapons as "non-lethal" weapons, they can be deadly if used against the head, neck, spinal column, and kidneys. A heavy object, swung hard, can break bones and injure vital organs well under the skin. This is especially true in the abdomen, where driving a club in point first can damage the spleen, bladder, or bowels.

A type of blunt injury that is fairly common comes from being hit by a car. Vehicular homicide is probably more common than suspected. A typical scenario for a purposeful vehicular homicide is the "hit and run" accident. This type of killing is most likely not an organized crime killing, because it appears to be an accident. Organized crime bosses don't mind if their killings appear to be killings, because a mob hit is a forceful expression of their power and a warning to others.

POISON

Poisons can be powder, liquid, or gas. There are many types, and many ways and reasons for ingesting them. This is why it's

hard to make a firm determination of homicide, suicide, or accidental death in some poisoning cases. Let's go over a few poisons quickly, and note their peculiarities:

Narcotics

These are usually taken illegally, as "recreational" drugs. An overdose of opium, morphine, heroin, or other narcotic can be lethal. Although narcotic users become habituated and develop a "tolerance" to the drug, requiring ever larger doses, they can still overdose.

Killing by means of a drug "O.D." is one way of trying to confuse the case. There are two basic ways of killing with an O.D. One is to administer the drug by force, holding the victim down while injecting it into his vein. The easier and simpler way is to give him a "hot shot." This is a pure dose of the drug. Street narcotics are diluted, often down to five or ten percent, and a user will become accustomed to injecting a certain quantity. Substituting the pure drug will lead to a self-administered O.D. This is a technique often used to liquidate snitches or suspected snitches among drug users. It's practically impossible to gather enough evidence to prosecute such a case.

Barbiturates

These are easily available through legal channels with a doctor's prescription. Some people build up legal addictions to barbiturates by "doctor shopping" and obtaining a prescription from each one. More, some physicians build up reputations as "Dr. Feelgood" by handing out prescriptions upon demand.⁷

Some people with legitimate prescriptions for barbiturates save up their pills for suicide. This is more likely in the elderly, and those with incurable illnesses. The dose for suicide is between two and four grams of barbiturate. Some suicide victims increase the action of the drug by washing down the pills with alcohol.

Alcohol

Drinking alcohol is ethyl alcohol, fermented and/or distilled from various grains. Death from drinking alcohol is more likely to be as a chronic illness, but alcohol overdose can be lethal. A Blood Alcohol Level of .10% is legal intoxication in most states, but a .40% BAL or higher is in the lethal range. Alcohol is a depressant, and slows down respiration and heartbeat until the victim dies from lack of oxygen.

Methyl, butyl, and other alcohols are much more toxic than ethyl alcohol, and drinking sub-lethal doses can damage the nervous system, and other vital organs. These types of alcohols are used in paint thinners, "canned heat," and other industrial chemicals. Chronic, deteriorated alcoholics will nevertheless drink it to get a "buzz." Some alcoholics believe that straining it through cheesecloth or an old sock removes the poison. Only 30 to 60 milliliters of these alcohols can cause death.⁸

Cyanides

The gas, hydrogen cyanide, is a poison, and is used for criminal executions in several states. Cyanide salts, such as potassium and sodium cyanide, are equally poisonous, and when combined with acid release hydrogen cyanide, the gas. Cyanide combines with the blood's hemoglobin, displacing oxygen, and the victim dies from lack of oxygen.

All of these have been used for both suicide and murder. Death is rapid, and the victim has a definite blue tinge to his lips. An almond odor often accompanies cyanide poisoning.

Acids and Alkalis

Drinking nitric or sulfuric acid is one way to commit suicide. Excess acidity in the bloodstream, as well as physical destruction of the intestines, leads to death. Ingesting lye or another alkaline corrosive can also be lethal, and it's an equally painful way to

die. People who choose this method of suicide are usually deranged.

A practical point is that it's hard to poison someone with an acid or alkali. The sharp, burning taste makes the poison hard to disguise.

Heavy Metal Salts

Arsenic trioxide is a common heavy metal salt used for murder or suicide. This has a sweetish taste, and is a white powder often used for killing pests. Mercury, bismuth, and antimony salts are also poisonous, but less commonly used for murder. All of these heavy metal salts are easily detectable by post-mortem tests.

Alkaloids

These are vegetable extracts, although synthetic versions are also available. Alkaloids vary in their effects upon the human body.

Curare kills by paralyzing the central and autonomous nervous systems. Curare must be injected. It won't kill when taken by mouth, because gastric juices destroy the substance. Strychnine kills by causing heavy convulsions, and stopping breathing. Nicotine is a clear, heavy, oily substance when pure, and is easily absorbed through the skin. A drop or two on the skin will cause paralysis, and will kill within a few minutes. Nicotine sulfate is a plant spray, and is also lethal when taken by mouth. Scopolamine is a sedative, and kills by putting the victim into a deep coma in which breathing and heartbeat stop, as with barbiturate poisoning.

Carbonmonoxide

Carbon monoxide combines with hemoglobin, and prevents the blood cells from carrying oxygen. Carbon monoxide is usually a means of accidental or suicidal death. A suicide will

typically start his car's engine and close the doors and windows to the garage. Accidental deaths from carbon monoxide poisoning result from using heaters in poorly ventilated rooms. An indicator of carbon monoxide poisoning is a cherry red color in the skin. The victim may also lose bladder and bowel control.⁹

Phenol (Carbolic Acid)

This is usually used for suicide. One half ounce is the usual lethal dose. The victim goes into a coma, and may have convulsions.

ChloralHydrate

This is a powerful sedative, a fast-acting, and sometimes lethal, clear, oily liquid. It has a bitter, burning taste, which a killer may disguise by placing it in an alcoholic drink, and the victim becomes unconscious and slips into a coma.

All of these poisons are detectable by simple or sophisticated tests. The investigator should suspect poison when there's no other apparent cause of death and/or there are signs of poisoning, such as an abnormal skin color.

ASPHYXIATION

This can be by manual strangulation or with a ligature, a rope, wire, or strong cord around the neck. Another way which falls into this category is drowning. Forceful choking usually leaves marks in the skin. Obvious injuries to the skin of the neck, including fingernail marks, suggest choking. Any sort of noose indicates this, too. "Petechial hemorrhages," which are tiny blood clots that look like small red dots, on the inside of the eyelids also suggest strangulation. Biting of the tongue can also be a sign of strangulation, but it may also suggest convulsions from poisoning.

Hanging is a common method of suicide, but it can also be homicidal. The rope or wire leaves its marks, and the skin has tiny bruised areas under the ligature. Hanging also tends to result in loss of bladder and bowel control.

If the victim has been hanging for a couple of hours or more, post-mortem lividity will be apparent in the neck, right above the ligature. Blood will also flow to the lower arms and legs.

A type of hanging which is accidental death is the masturbation hanging, or sexual asphyxia. This has occurred among adults and teen-agers, males and females. It's more common among males.

Restricting the flow of blood to the brain, or the oxygen content of the blood, enhances sexual sensations for some. Some ways of doing this are hanging with a padded noose, placing a plastic bag over the head, or inhaling gas. The intent is to proceed with oxygen restriction and masturbation until the "high," and climax, and then to stop, but sometimes the victim loses consciousness, can't loosen the noose, and instead of coming, he goes. Indications of a masturbation death are sex toys, lubricants, and pornography found at the scene, leather garments on the victim, and evidence of masturbation.¹⁰

Drowning can be accidental, suicidal, or homicidal. A victim with hands tied behind his back is obviously the result of a felony. An autopsy can determine if a body found in water actually drowned, or was killed by other means and placed in the water. A drowning victim may sink, at first, as the lungs empty of air, but will quickly return to the surface as a "floater."

Suffocation can result from obstructing breathing by placing the hands or an inanimate object, such as a pillow, over the nose and mouth. This, too, can be accidental. Several years ago there was an epidemic of infants suffocating because they had covered their heads with plastic bags their parents had given them as toys.

ELECTROCUTION

A surprisingly light current of electricity can cause death if it stops the heart. As little as fifty volts can do it. This is in sharp contrast to the approximately 2000 volts used in electrocution. The high voltage used in executions is enough to cook the body, to assure that the person will not recover.

Electrocution is usually accidental. Less often, electricity is used for suicide. Very rarely does a killer use electricity.

The evidence is exposed electrical leads in the area. The body may show signs of convulsions, such as a bitten tongue and a contorted position. The skin may be reddened. There are usually also characteristic electrical burns on the skin where the electrodes or wires touched.

CONCLUSIONS

It's vital for the investigator to know something about how death occurs, and how the various methods of inducing death work. The investigator doesn't need the comprehensive knowledge of the forensic pathologist, but he needs to know enough so that an autopsy report doesn't go over his head.

SOURCES

1. Wound Ballistics, James Boyd Coates, Jr., MC, and James E. Beyer, MC. Washington, DC, Office of the Surgeon General, Department of the Army, 1962, p. 204.
2. Gunshot Wounds, Vincent J. M. Di Maio, M. D., New York, Elsevier Science Publishing Co., Inc., 1985, p. 45.

3. Ibid, pp. 51-52.
4. Ibid, p. 76.
5. *ibid*, p. 222.
6. Bloody Iron, Harold J. Jenks and Michael H. Brown, Comville, AZ., Desert Publications, 1978, p. 65.
7. This is a quick way for an unethical physician to build up a practice without taxing his medical skill. A visit for a prescription brings a fee, and the doctor doesn't have to work very hard to make a diagnosis. In upscale areas, physicians who are Dr. Feelgoods can even charge premium prices for this sort of office call.
8. Criminal Investigation, Department of the Army Field Manual 19-20, July, 1981, pp. 236-237.
9. Ibid, p. 241. Also see *Owe/ The Reporters Are Here*, Gerald W. Garner, Springfield, IL, Charles C. Thomas, Publisher, 1987, pp. 3-12.
10. Practical Homicide Investigation. Leon J. Geberth, New York, Elsevier Science Publishing Co. Inc., 1983, pp. 250-257. Although this is a rare form of death, the sensational aspects give it a prominence beyond its importance in authoritative texts on homicide investigation. It's important to check out very carefully any case of suspected masturbation death, because some of the indicators could also point to a sex murder. Even without this complication, the dead masturbator might have had a partner, a possibility not considered in the existing accounts. The value of the partner, if found, is mainly as a witness.

DEATH AND AFTERWARDS

Dying can occur in an instant, or it may be prolonged. It's often hard to establish the exact second of death because the definition of death keeps changing.

One hundred years ago, cessation of breathing and heartbeat were the decisive signs of death. With increasing medical knowledge, and improved methods of emergency care, the point of death has moved back. A person may still be revived after pulse and breathing stop. Right now, the only definite indicator of death is "brain death" as shown on an electroencephalograph, or EEG. This occurs roughly four minutes after blood flow to the brain has stopped. Once brain death occurs, there's no chance of reviving the person, although individual organs may remain alive for hours after death. The growing transplant and body parts industry depends on the fact that the human body does not die all at once.

STAGES AFTER DEATH

Once the heart stops pumping, the brain begins to die, with the rest of the body following afterwards. Loss of blood pressure results in the blood flowing to the parts of the body lowest to the ground. If the body is on its back, the blood will leave the face, and the front of the body, and flow down towards the back.

This is what gives the top of a corpse its pallor. Consequently, the lower part of the body will be ruddy, as a result of "post-mortem lividity." Blood flow into lower areas becomes noticeable about thirty minutes after death.

The color of the areas into which the blood flows isn't red, but bluish, because the blood's oxygen is consumed. However, certain pressure areas on the lower part of the body won't have post-mortem lividity, because the weight of the body has prevented blood flow into those areas.

Blood spilled from a wound begins to clot. Later, blood stains dry out. Blood within the body, such as the stains from post mortem lividity, clot after about eight hours. This fixes the lividity, and moving the body after eight hours won't affect the discoloration.

In some cases, especially violent death, the bowels and bladder empty immediately. Otherwise, this occurs after the sphincter muscles relax, many hours after death.

After death, the body begins to cool. Temperature loss depends upon ambient temperature, the amount of clothing, body fat, air circulation, and other factors too numerous to list. There is, unfortunately, no rule of thumb to determine time of death by body temperature. Obviously, if the body is still warm to the touch, death was within the last few hours. A cold and clammy body suggests that death occurred many hours ago. In very hot climates, where the temperature is 98 degrees or more, the body won't cool.

Rigor mortis, the stiffening of the muscles, begins within two hours after death. It's important to distinguish rigor mortis from cadaveric spasm, which is a clutching of the muscles of the arms and/or hands at the time of death. This can occur from clutching a weapon, for example.

Rigor mortis is first noticeable in the neck and jaw, and the process is complete in eight to twelve hours. The body remains

rigid for a few more hours, and the muscles begin to relax again about eighteen hours after death. Relaxation is total within about forty-eight hours. However, temperature will affect the onset and cessation of rigor mortis. Once the body begins to relax, decomposition sets in.

Decomposition, also called "putrefaction," is the tissue breakdown that usually occurs after death. In hot, dry climates, a body may mummify instead of decomposing in the normal way.

In putrefaction, the skin becomes greenish, especially on the abdomen and/or genitals. Elsewhere, the skin darkens, often making the victim's race hard to determine. Inside, gas build-up from the intestines makes the abdomen swell. There is generalized bloating from tissue breakdown.

Gas formation, like tissue breakdown, depends upon temperature. It slows down in cold climates, and accelerates with heat. Gas accumulation inside the body is what causes the "floaters," the reappearance of the body dropped into a body of water. Disposing of a body in water often resulted in the body's resurfacing after a couple of weeks. Gangland killers often dropped their victims into a bay or river, weighted down with chains and cement blocks. This is the origin of the expression, "cement overcoat" or "cement overshoes." Some gangland killers actually set their victim's feet into tubs of concrete to ensure that they sank. Buoyancy developed by decomposition gases, however, often brought the entire affair to the surface. Killers then slashed their victims' abdomens to allow an escape route for gas, but the wounds sometimes sealed themselves and retained the gas.

The skin begins to blister and peel. After several days, moving the body will cause loss of skin.

In very moist climates, "adipocere" will form. This is a layer of soapy matter that appears on the skin.

Attack by external life comes about within a few hours after death. Outdoors, hungry animals may start feeding on the body very quickly. "Carrion eaters" is the term usually used to describe the jackals and other animals that eat bodies, but actually any hungry carnivore will feed on a corpse. Buzzards often drop down on corpses out in the open. House pets will eat their dead masters after they die and stop feeding them. Flies and maggots can appear within 24 hours.

ESTIMATING TIME OF DEATH

Time of death is one of the most important facts to establish because often the case hinges on time. Knowing time of death allows zeroing in on a suspect's activities, and checking out any alibi provided. Time of death helps focus a murder investigation because it discloses a "window of opportunity" for the perpetrator.

Time of death resolves whether or not an insurance policy applies in certain cases. If the policy has a suicide clause, time of death may determine payoff.

The Basic Rule

The more recent the death, the more precisely it's possible to fix the time. If death took place within 24 hours, the subject's body temperature can fix the time of death to within a few hours at most. By contrast, a decomposed body may have been dead for weeks or months, and establishing the exact hour of death is impossible. It would be difficult enough to narrow the time to a specific day. A skeleton offers no hope of pin-pointing the time of death, and often the best result possible may establish the year of death.

Pin-pointing time of death is often not an exact process. It is often possible to reconstruct the victim's last 24 hours, and

establish events to provide a "straight edge" against which other events can follow. A straight edge is a definite and fixed point, clearly established because of the circumstances. For example, finding a bank teller machine receipt with a date and time printed on it shows that the victim was likely alive up to that moment.

Witnesses

Witnesses often provide the best hope of pin-pointing time of death. An eyewitness to the crime obviously can establish what time it occurred, but often circumstantial witnesses can narrow the range. A circumstantial witness may be the last person known to have seen the victim alive. This establishes one firm point in time, a straight edge, and the investigation can move from there.

Circumstances

A victim's circumstances and daily routine can help provide some straight edges from which to work. It's often possible to establish times of newspaper delivery, mail delivery, etc., and work forward from these if the victim collected them. Another help can be the weather. If, for example, it started to rain at a certain hour, and the victim's windows are still open, this suggests that he was no longer able to close them at that time.

Condition of the Body

We can lay out a scale of post-mortem changes to help estimate time of death.

0-5 minutes: Body reflexes completely extinct. Blood begins to clot.

10-20 minutes: Blood clotting complete. Color changes from red to brownish.¹ Wet weather will change this, and rain will keep blood from clotting until it washes away.

- 30 minutes: First effects of post-mortem lividity appear. The lower parts of the body turn ruddy.
- 1 hour: Post-mortem lividity well along. Skin will still "blanch." Pressing a finger into livid skin will cause it to be white after release of pressure, and color will quickly return.²
- 2 hours: Rigor mortis begins.
- 5 hours: Skin no longer blanches. Body mostly rigid. Feels cool to the touch.
- 8 hours: Rigor mortis complete. Body cold.
- 24 hours: Rigor mortis starts to relax. Body cold. Abdominal swelling begins.
- 48 hours: Body totally relaxed. Skin starts to turn green. Body appears bloated.

The foregoing time-table is very rough. There are many fudge factors that can throw off the figures given. One is that the experts disagree. One states that rigor mortis begins, as a rule, two to four hours after death.³ Another states that it may begin within fifteen minutes, but as long as fifteen hours after death. This source states that, on the average, it begins in five to six hours.⁴ These apparent contradictions are probably the result of the many variables, both physiological and circumstantial, that we find in death. This is why it's vital to obtain an expert opinion from a medical examiner as soon as possible, and to investigate the circumstances of the victim's final hours.

SOURCES

- 1 Fundamentals of Criminal Investigation, Charles E. O'Hara and Gregory L. O'Hara, Springfield, IL, Charles C. Thomas, Publisher, 1981, p. 516.
2. Practical Homicide Investigation, Vernon J. Geberth, New York, Elsevier Science Publishing Co. Inc., 1983, p. 172.
3. Ibid, p. 166.
4. Fundamentals of Criminal Investigation, p. 529.

PART II: TACTICS

FIRST RESPONSE

The homicide investigator is not often first on the scene. A citizen may approach a patrol officer to report a body, or the officer himself may find a body while on patrol. Speed of response is important, because of the peculiarities of a homicide case. Experienced investigators know that a homicide will be cleared within 48 hours if it's going to be cleared at all. Cases that go beyond this limit have little chance of clearing. Suspects flee, and evidence becomes stale or damaged as the trail becomes cold.

Many homicides begin as other types of cases, such as assaults or robberies. This is why a homicide investigation really begins when the police dispatcher first picks up the telephone. If the caller is a citizen reporting finding a body, the dispatcher should obtain the location and get a unit rolling, and then question the caller further. Among the details needed are the caller's identity, whether or not the caller established that the victim is actually dead, whether the caller witnessed a crime or not, and the identities of any other people on the scene.

The responding patrol unit should not roll "Code Three" unless there's reason to believe that the victim may be alive, and in such a case an ambulance should follow immediately. A "man down" call can come as the aftermath of a "211 in progress" call, in which case the unit and a back-up would roll Code Three or Code Two.

As we'll see, the work-load at a potential homicide scene can be very heavy during the first few minutes. There are several high-priority tasks officers must accomplish almost simultaneously. A one-officer unit can handle the job only if the victim is dead, in a remote location, and there is no crowd. In many cases, a two-man unit is barely adequate, and with many bystanders it requires at least four or five officers.

On the scene, the patrol officer's first priority is to determine if the allegedly dead body is really dead. In some cases, death is obvious from the circumstances. An officer coming upon a decomposed cadaver, or one covered with maggots and flies, can have no doubt. In such a case there's no need to approach the body, and it's better to stay away to avoid disturbing the crime scene.

At times the responding officer can't tell if the person's truly dead without a quick examination. He should warn bystanders to stay away while he checks out the body. If the responding unit is a two-man unit, his partner can attend to security while the first officer conducts the examination. The officer can be sure that the victim is dead if he detects any of the following:

- The body is cold.
- Rigor mortis.
- Post-mortem lividity. We'll discuss this further in another chapter.

There are several more signs of death, but they're less certain:

- No pulse and no breathing, unless the victim has just gone down.

Checking for a pulse should be both at the upper wrist and the neck. The officer should also listen for a heartbeat. Yet another quick test for death is to press down hard on one of the victim's fingernails, until the nail bed is white, and release

suddenly. If the victim's still alive, color will quickly return to the nail bed.¹

- The bladder and/or bowels have let go.

The officer should also be aware that some people defecate or urinate from fear, and that this isn't necessarily a conclusive sign of death.

- Absence of eye reflexes. Shining a flashlight into the pupil does not cause a contraction, and touching the eyeball does not cause the eyeball or eyelid to move reflexively.

The officer should be very careful about concluding that the victim is dead if the incident has just occurred. He should also consider the possible cause of death, and understand that some, such as electrical shock or drug overdose, can induce a deep coma resembling death. The officer should also try to avoid drawing any conclusions from the apparent seriousness of the injury. A large pool of blood doesn't necessarily mean a fatal wound, and a gaping hole with bone showing through can be a survivable injury.

Unless the officer is certain of death, he should proceed as if the victim is still alive. This can mean applying cardio-pulmonary resuscitation and calling for the paramedics. Failure to do so may result in a large lawsuit later, if the victim's survivors conclude, and can prove, that the victim was still alive when the officer pronounced him dead. The practical point is clear: Calling the paramedics places the responsibility upon them.

PARAMEDICS

Preserving the crime scene is important, but if the victim is still alive, paramedics may trample the evidence while trying to save his life. The case takes a definite turn for the worse when the victim dies on the way to the hospital or in the emergency room. Some linger for weeks before dying of complications.

It's very difficult to prevent paramedics from trampling the crime scene because they have their job to do, just as the homicide officers have theirs. Further difficulties may arise at the hospital, because emergency care may destroy evidence. One example of this happened after the shooting of President Kennedy in 1963. The tracheotomy performed upon him at Parkland Hospital obscured the bullet's exit hole.²

There are two practical steps homicide officers can take to minimize the effects of these incidents:

1. Close liaison with paramedics and careful explanation of the need to preserve evidence may influence them to be more careful around the crime scene. Officers should point out that cutting clothing off victims can destroy evidence if the cuts destroy bullet holes and knife slashes, etc.
2. Some departments issue cameras to patrol officers, or to supervisors, to record crime scenes. The first officer to arrive with a camera should photograph the scene without delay. This is crucial if the victim is still alive. There should be a photograph of the scene, looking in towards the victim, from each point of the compass, or each corner of the room, and at least one close-up of the victim, including his injuries, if visible.

Members of small departments without a police photographer may have to depend upon the cooperation of the press for photographs. For this reason, officers should do what they can to promote friendly relations between police and press. Mutual cooperation can be very beneficial, and as a practical point, reporters and photographers will often reciprocate trust by respecting confidences. Departments in small towns and rural areas often have close relations with the press, and many are on a first-name basis.

The press is not always conveniently at your service. This is why a simple camera, even a Polaroid, is essential. The camera should be simple enough to be operated by someone who's not

a photographer, and a Polaroid provides an instant print so that the officer will know whether or not he's gotten a good shot.

The officer with the camera should not make any chalk marks around the body before taking his photographs. Chalk marks are unnecessary if the officer has taken a couple of quick Polaroids, anyway. Still, tradition lives on, and many officers make their ritualistic chalk marks around the body at a crime scene.

An important point is to take a couple of photographs of the bystanders, if any. In some cases, such as street gang killings, perpetrators may linger as part of the crowd to discover if the victim is truly dead, or simply from morbid curiosity. The inconspicuous way to photograph the bystanders is to keep them as background for photographs of the crime scene.

DYING DECLARATIONS

If a dying victim is still conscious, the officer may obtain valuable information or evidence from him. This can be a dying declaration, admissible in court, or an off-the-cuff statement that provides investigative leads.

Each jurisdiction has its requirements for a dying declaration. Although they differ in detail and wording, the basic requirements are similar. The victim must believe that he's going to die, and actually must die later. The victim must also be of sound mind, as far as it's possible to tell, and the statement must refer to the manner of death and the identity of the killer.

The officer hearing such a dying statement should write it down. Covering the fine points isn't as important as getting the information. The killer's identity is the first priority because it will point the investigation in the right direction. Getting the victim to state that he knows he's dying is next. After that comes information which is mere legal "housekeeping," such as name,

address, and an affirmation that the declaration is a true statement.

A tape recorder can be very valuable here, because the victim's speech may be feeble or slurred, and only intelligible after many playbacks. A recorder can also serve to record a suspect's statements.

WITNESSES

Responding officers should try to locate the person who made the call, and locate other witnesses. If the incident has just happened, as in the case of a "211 in progress," officers should obtain a description of the suspect(s) and their direction of escape.

The interviewing officer should not try to obtain a detailed account from any witness. That belongs to a later stage, when the homicide investigator arrives. For the moment, he should note only information that's immediately useful, and separate witnesses to prevent their comparing accounts and contaminating their responses. A short checklist for officers to follow when questioning witnesses and others at the scene is this one:

- Name, address, and phone number.
- ID (driver's license, etc.).
- Did you see what happened?
- Who did it?
- Description of suspect(s).
- Where did he or they go?
- Did anyone else see what happened?
- Who?
- Where is this person now?

Responding officers should always be aware of whether or not the neighborhood's residents generally cooperate with the police. In some cases, a suspect may try to pose as a witness.

An important point is photographing the bystanders, if any. At times, the perpetrator has not yet left the scene. More commonly, members of the crowd are witnesses, and if they leave before officers can interview them, photographs can help in identifying them later.

SUSPECT(S)

If the officer finds the suspect at the scene and arrests him, he should immediately remove him from the immediate crime scene area. It's a serious error to allow the suspect to re-enter the crime scene for any reason, as this allows the opportunity to tamper with evidence, or to render invalid trace evidence linking him to the crime scene.

The arresting officer should follow normal arrest procedures, including handcuffing and searching the suspect. With normal "street smarts," he should be aware that a suspect who surrenders peacefully might, after thinking it over, decide to try to escape.

The arresting officer should remain alert to any statements the suspect makes, for two reasons:

1. These can provide investigative leads.
2. Spontaneous statements fall into the category of "res gestae" or the facts of the case, and are admissible in evidence. This is especially true of statements made before arrest.

The officer should therefore allow the suspect to make any spontaneous statements he wishes, and not interrupt him with a Miranda Warning. It's important to write or tape record

everything the suspect says, before as well as after the Miranda Warning. This is so even if the suspect's obviously lying. If the prosecution can demonstrate in court that the suspect lied at the outset, it reflects badly upon the suspect's credibility.

Once the suspect stops speaking spontaneously, the officer can read him his rights and ask him to repeat his statements. If the suspect is a minor, it's good form to read the rights to the parents, too, if they're on the scene. This is simply a form of redundant double insurance to aid prosecution. However, the officer should not get into a detailed interrogation of the suspect, as that's the homicide investigator's job.

TAKING NOTES AT THE SCENE

The responding patrol officer should spend whatever time he can spare writing the important details of the crime scene in his notebook. Photographs take higher priority, but if he's finished with them or doesn't have a camera, recording the main facts will help the investigation. He should work from the center outward, following this checklist:

- Victim's description, position and condition. Note any wounds, or any obvious cause of death near the body. This has to be first because if the victim is still alive, he won't be there long,
- Identifying documents, if the victim is still alive. This isn't necessary if witnesses can identify him. If the victim's dead, the officer should not disturb the body to reach his wallet.
- Location of any weapons, shell cases, in relation to the victim.
- Presence of footprints, bloodstains, cigarette butts, matches, or other items near the body.
- Odors at the scene. This is very important, as often odors don't linger, yet may provide clues. Odors of gunpowder, perfume, gas, marijuana, and tobacco are worth noting.

- Evidence farther from the victim, such as footprints, tire tracks, fingerprints, etc.
- Anything it was necessary to touch or disturb to gain access to the premises or to treat the victim. This can include doors and windows, light switches, and furniture. It's also important to note the condition of light switches, windows, etc., and whether they were opened or closed, turned on or off, etc., when the officer arrived.

If the paramedics arrive to transport the victim to the hospital, an officer should follow them. This is necessary so that he may take and retain custody of the victim's clothing and property, some of which may later serve as evidence. If the victim dies at the hospital or en route, a homicide investigator should join the officer there. In departments too small to have more than one homicide investigator, the robbery detective or other investigator will have to fill in.

SAFEGUARDING THE CRIME SCENE

The first officer on the scene should be generous in estimating the size of the crime scene. To be safe, he should exclude people from all of the area he can control, not just what he thinks is the spot upon which the victim died. This is because the area of action can be larger than immediately apparent. Unless it's essential, the officer should not even enter the crime scene, and certainly not turn on lights, open doors or windows, or use the telephone.

If the crime scene is indoors, protecting it from deliberate or unintentional tampering is easier than if it's outdoors. A crime scene on a sidewalk or roadway brings traffic problems, as well as weather hazards. Rain will wash away stains that can serve as evidence, for example. The first officer on the scene should not hesitate to intervene, using common sense, to preserve

as weather hazards. Rain will wash away stains that can serve as evidence, for example. The first officer on the scene should not hesitate to intervene, using common sense, to preserve evidence. Placing newspapers over bloodstains to keep them from being destroyed by rain helps avert loss of evidence. Improvising is better than doing nothing.

Keeping all unauthorized and unnecessary people out of the crime scene is essential to avoid harming evidence. This is the responsibility of every officer at the scene, but enforcing it sometimes is up to the senior officer present. In the case of press or civilians, enforcement is simple. If a high-ranking officer, the prosecutor, or the mayor himself shows up, this creates a delicate political problem, and the senior officer on the scene has to delicately inform the V.I.P. that the investigation isn't yet complete, and that the crime scene is still "sealed," and awaiting the arrival of the homicide investigator. Sometimes, there's no solution to this problem.

ROLL OUT

There should be a departmental policy regarding who has the authority to call for additional help. The senior officer can order the dispatcher to send for the homicide investigator or team, the medical examiner, and the prosecutor. Although it's not common practice, having a prosecutor "roll out" with the homicide team brings him into the picture at an early stage, and allows more coherent direction of the investigation from the start. Some prosecutors prefer to be involved from the first moment. However, politics often spoils this ideal, and such close cooperation is sometimes hard to obtain.

Officers in small departments may have to call upon a larger agency for help in a complex case. A five- or ten-officer department does not have an ID technician, a crime laboratory, and many other resources that only a large agency can support.

In some locales, there are formal or informal agreements, between large and small agencies, to provide for mutual aid when necessary. In some states, the state police or department of public safety is mandated by law to provide aid to local agencies.

The Chief of Police or the Chief of Detectives should have the mechanics of liaison established well in advance. It's better to follow a plan, or at least a few guidelines, than to have to improvise. This is why a meeting with members of nearby agencies is necessary to find out what resources are available, and what the procedure is for requesting them. The homicide investigator who may need help from outside agencies should keep in his notebook a list of resources and services available, the name of the agency, and the name and phone number of the person to contact.

Although this isn't the place to delve deeply into inter-agency politics, it's important to note that certain practices and attitudes degrade inter-agency cooperation. A "big daddy" attitude displayed by officers from the larger agency will quickly chill relations. So will any attempt to take over the case. On the other side of the hill, a small agency chiefs distrustful or territorial attitude can make a request for help only the last resort in a desperate situation. When this happens, evidence becomes stale, and the chances of solving the case shrink.

SOURCES

1. Fundamentals of Criminal Investigation, Charles E. O'Hara and Gregory L. O'Hara, Springfield, IL, Charles C. Thomas, Publisher, 1981, p. 501.
2. Report of the Warren Commission, New York, Bantam Books Edition, 1963, p. 22.

THE HOMICIDE INVESTIGATOR ARRIVES

The investigator's first task, upon arrival, is to seek out the patrol officer who has recorded the facts of the case. It's important to verify that the crime scene has been secured, and that the patrol officer has begun his end of the investigation. The investigator should interview him, copy his notes into his own notebook, and inquire whether any salient facts have changed. He should make his own examination of the scene with the patrol officer, and ask any questions which seem necessary. It's necessary for the investigator to "catch up" with the events, and the best way to do this is by quickly reviewing everything done so far.

The investigator should also interview witnesses and suspects, sketch and photograph the scene, and gather evidence. At the same time, he'll be directing other investigators, or assigning patrol officers to tasks, and he should log these in his notebook. If he establishes a formal command post, instead of working out of his car or van, the C.P. should not be right in the crime scene.

In some cases, the investigator will have to use his authority, and often a lot of tact, to clear the area. In some departments, many officers show up at the crime scene, offering to help or just hanging around. Anyone not needed should return to other duties, and sometimes a word with the watch commander can help.

It can help to set up both an inner perimeter and an outer perimeter. The inner perimeter encloses the crime scene itself. The outer perimeter is for the command post, paramedics, the press, and high-ranking officers and politicians. This is mainly a psychological tactic, as it gives these people the impression of having been allowed into an excluded area as a gesture of confidence.

If a police officer is the victim, the investigator can expect off-duty officers to appear and volunteer their help. It's impossible to turn them away, especially as some may have been close friends of the deceased. One way to handle this problem is to set up a room or special command post for volunteers, and advise them that they'll be called when there are assignments to fill. Volunteer officers can help with canvassing, and the many other tasks that pile up in an investigation.

THE INVESTIGATIVE LOG

Recording the sequence of events can be vital in building a case and documenting it for prosecution. If manpower allows, the homicide investigator can appoint one officer to begin and maintain the log. If manpower's limited, as in small agencies, the investigator will have to do it himself, and take short-cuts.

Information necessary for the log are personnel assigned and times of arrival. Fortunately, this information's available from dispatch records, tapes of radio transmissions, and records kept by each individual on the scene. Additionally, paramedics, other detectives, medical examiners, and others keep their own records, and the homicide investigator need take only brief notes to refresh his memory later, when he starts building the detailed record.

The investigator should try to work from a check-list, as human memory is fallible. As some call-outs are in the middle

of the night, people at the scene are not likely to be at their best, and anything which helps the memory is justified.

Another help is the "lead card." This is for jotting down any bit of information which can result in a task or assignment to check out. The lead card allows the investigator to note any follow-up and the results it produced. A short stack of 3" x 5* file cards is sufficient for this purpose.

SEARCH WARRANTS

If the victim is the owner of the premises, there's usually no problem in searching the scene. Likewise if the crime scene is a public place. However, if the suspect owns the premises, a search warrant probably will be necessary as a precaution against having the evidence later suppressed as tainted. The key word here is "standing." If the suspect has standing regarding the property, as owner or custodian, he can object to a search. Even if he consents, a defense attorney can later argue intimidation by the police, which is why it's better to nail down the case with a search warrant first.

WITNESSES

This is the time for a more detailed questioning of witnesses. Information collected by the patrol officers should enable the investigator to set his priorities and decide which witnesses have information that won't keep, and which he may interview later. If there are few witnesses, it may be possible for the investigator to question them all briefly, and make arrangements to take their statements later. The investigator who doesn't have a tape recorder for this is truly ill-prepared. A tape recorder makes it possible to compare statements made on the spot with later ones, and to reconcile discrepancies.

Another purpose of this early interviewing is to assess the witnesses and their value. Inspecting their ID is a vital step, and the investigator should do it again, even if he's sure that the patrol officer did. He should also assign someone to check out their ID and to run their names through NCIC. A close look sometimes uncovers witnesses who aren't truly willing to cooperate with investigators, who will "rabbit" at the first chance, and who are traveling on forged or stolen ID. Depending upon the locale, some witnesses have prior convictions, or even charges pending. Finding this out can provide inducements for cooperation.

Paramedics are witnesses, too. Interviewing them can often provide vital details in an investigation. Obtaining a copy of their report rounds out the paperwork, and saves asking many routine questions. If a copy machine's conveniently available, the investigator can do this on the spot. If not, it's often possible to use a copy machine at the hospital. In some locales, paramedics are fire department employees, and as a sister service, the fire department provides copies of all relevant paperwork to the police.

Witnesses who seem unusually productive are worth interviewing at the office. With help, they'll be able to provide a more detailed description of suspects. One type of help is the police artist's rendition. Another is the "Identikit," with which the investigator puts together transparencies with facial features to create a composite likeness. Neither has the versatility or convenience of a computerized I.D. system.

With a computerized system, it's now possible to store descriptions in a computer's memory, and to search for likenesses electronically. Only major agencies have such sophisticated computers, although there are computer programs suitable for desk-top machines such as the IBM and its clones. These are made to produce photographic renditions of suspects'

descriptions, using a face built up from features in the computer's memory.

One system is the "COMPHOTOFIT," a computerized facial identification system made for use with a desk-top computer. A detailed description of this device and its use is in the "tools" section.

PHOTOGRAPHING THE CRIME SCENE

The homicide investigator should certainly have a camera, and take his own photographs of the scene, unless the department is large enough to have a photographic technician. This apparent duplication is perfectly justifiable because the patrol officer took what we can call "insurance shots," hasty photographs in anticipation of the scene's being disturbed. The investigator will have a better idea of what he needs, and can take close-ups of any point of special interest.

It's impossible to exaggerate the importance of timely and detailed photographs. Evidence becomes lost, kicked around, and otherwise disturbed or trampled. The officer sketching the scene is only human, and may overlook an important detail. Photographs provide a way to verify the accuracy of the crime scene sketches at a later date.

Traditionally, targe-format cameras have dominated crime scene photography. The larger negatives were necessary because they produced better enlargements than smaller ones. Today's technical advances in both cameras and films allow top-quality photographs with 35mm cameras. The crucial factor is the skill of the photographer, not the size of the negative.

Another important point is versatility. There are specialized cameras, such as those used for 1:1 reproduction of fingerprints. However, such a camera is yet another piece of equipment to buy and to pack, and which needs its own film supply. The

logistics of supplying several cameras can be excessive for a small agency, and the best compromise is the high-quality 35mm single-lens reflex camera.

The 35mm SLR has to be the choice over rangefinder 35mm cameras, because the view through the eyepiece is what appears on the film. With separate viewfinders, the "parallax" effect assures that what the photographer sees is not quite what records on the film. This can be very important in close-up photography.

Another point is that most single-lens-reflexes are made for interchangeable lenses and have behind-the-lens light meters. Although the normal 50mm lens will be suitable for most crime scene photography, a very short 28mm lens can be helpful when there's not much room available.

Should the film be color, or black and white? Opinions vary. B&W is cheaper. Color film shows more, but some defense attorneys may claim color photographs of some crime scenes should not be admissible because of their "inflammatory" nature. This usually happens when there's a lot of explicit blood and gore.

There is an answer to this problem. The best film is a color negative film because this can produce both color and B&W prints. Many processing laboratories today handle color negative film, using the C-41 process. Larger agencies often have their own photo labs, complete with processor for color film. It's advisable to bring exposed film to a state or regional agency to keep the evidence in police hands.

There's one exception to the rule of color film. Fingerprints show up better with B&W because B&W film is sharper, as a rule. There are several excellent fine-grain, high-definition B&W films, but one with enough speed and latitude for general use is Kodak "T-MAX" 100 film. A faster film with good resolution is "T-MAX" 400.

If there's enough light for hand-held photographs, this will do unless it's necessary to shoot with the lens wide open. This usually won't provide enough depth of field for good sharpness over the photograph's range. A tripod and cable release are worth having because they allow the photographer to stop down for maximum depth of field, often important in an indoor scene.

Lighting can also be a problem. If it's necessary to use artificial light, a floodlight "bounced" off the ceiling is the best choice. Bounce lighting provides softer shadows, and minimizes the effect of the "inverse square law," which makes more distant objects appear much darker. It's also possible to bounce flash off the ceiling, but this has to be the second choice because it's not possible to see the effect before pushing the button. With a floodlight, the investigator or photographer can inspect the scene to ensure that everything important has enough light.

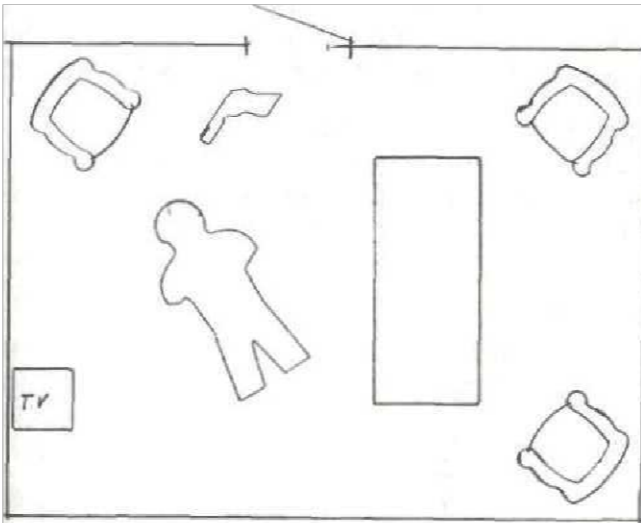
In certain cases, such as an outdoor scene at night, conditions are very difficult. If it's necessary to use direct flash, the photographer should "bracket" his exposures, taking an extra shot at one stop under and another at one stop over the calculated exposure. It then becomes necessary to print all three frames, unless one contains all of the detail needed without "dodging" or "burning in." This is important because it's tactically sound to be able to testify in court that the prints entered in evidence are "straight prints," without manipulation of any kind. "Dodging" or "burning in" a print is not falsification, but not every member of a jury might understand that. A canny defense attorney can suggest fudged evidence without making an actual accusation.

Videotaping a crime scene adds a couple of extra dimensions. It is more vivid, and allows the cameraman to "walk through" the scene, retracing the presumed path of the killer. It can also allow viewing the scene from the viewpoint of the victim, watching the killer's approach during a re-enactment. A very important point is that videotape is not a substitute for still

photographs. There should always be still prints of a crime scene. Videotape is only a useful supplement.

SKETCHING THE SCENE

Sketching the scene is mandatory because photographs don't accurately record distances between objects, and often give a somewhat distorted perspective. This is especially true when using wide-angle lenses, which emphasize the foreground while making the background appear more distant.



EAST — WEST WALLS/16 ft- NORTH — SOUTH WALLS/12 ft
 BODYS HEAD — M ft from West wall; 4 ft from North wall
 WEAPON —

S&W Model 19; 1 ft from North wall; Muzzle 5 ft from West wall
 TABLE ~2ft' x 6" located 4 ft from East wall; 2% ft from North wall

The crime scene sketch should include reference lines or points and all of the important details. For neatness, it's best to omit marking distances on the sketch itself, and list this information in a separate table. A very important point is to have clean sketches, done with the aid of a template, for use in evidence. A quick sketch at the scene will do for the moment, but the officer sketching should re-do it when he has the opportunity.

In the above simple sketch, we see that the scene is drawn to scale, with an arrow indicating North. Important measurements are listed below the sketch.

The situation may require more than one sketch. A "projection" sketch may be necessary when there are important details, such as bullet holes, in the walls. The projection sketch shows the floor plan, and the walls as if they were folded down flat.

In a crime scene with many complex details, it's worth making separate sketches to show each class of detail. For example, if there are many bloodstains, there should be a sketch identifying and showing each one. If there were many shots fired, a sketch showing all bullet holes, and the presence of fired cases, will clarify the situation.

Each sketch should also have identifying data, such as the case number, location of the scene sketched, date the sketch was drawn, and the name of the sketching officer.

PUSHING THE INVESTIGATION

There are other laborious tasks to perform before the investigator is finished with the crime scene and its environs. These involve medical examination of the cadaver, inspection of the scene for physical evidence, and safeguarding the evidence for later analysis and use in court. From all this, the investigator will have to construct a theory regarding the sequence of events.

If there's no suspect immediately identified, it will be necessary to develop a suspect list from information gathered from witnesses and/or evidence collected at the scene. The main elements are motive and opportunity. The effort will then be to narrow it down to the most likely perpetrator by a process of elimination based on alibis and physical evidence.

The investigator should inspect photographs of bystanders at the scene. It's worth doing this at least twice; when the prints are first available, and near the end of the investigation. This allows the opportunity to match faces with witnesses and suspects. It's also worth making an extra set of prints of bystanders to keep in a general crowd file. This can provide a lead in serial murders, which appear to be more frequent today.

HANDLING A

If a suspect or potential suspect is at the scene, it's important to allow him to develop the case against himself. This is why it's important to note down anything a suspect may say. Having a witness helps substantiate the case in court. There are some special cases, and special procedures to follow:

THE ROBBERY SUSPECT

A robbery suspect taken in the act doesn't always provide an open-and-shut case. There may be undiscovered accomplices, and investigators should allow the suspect to speak freely as long as he wishes. He may incriminate someone else. If the suspect is chattering away, his words may not be admissible if he hasn't been "Mirandized" immediately after the arrest, but they may provide a slew of investigative leads.

An important point is that the investigator must not ask the suspect any questions during this period, as questions can imply an interrogation. Once the spontaneous chatter ends, the investigator can Mirandize him and take a more formal statement. Questions to clarify points brought out before the arrest are appropriate at this time.

THE MUTUAL COMBAT SUSPECT

In this type of situation, there's no obvious felony complaint, as there is in an armed robbery scenario, which leaves the investigating officer with a little more latitude to elicit information without giving the suspect the umbrella of the Miranda Warning. Treating the suspect as a witness, and obtaining all possible information from him before informing him that he's under arrest, is a good tactic to pursue.

THE DEFENSIVE KILLING SUSPECT

Investigating officers encounter killings billed as "self-defense." In such cases, it's important to allow the potential suspect to make as extensive a spontaneous statement as he wishes to justify himself. With appropriate verification, these statements will support the contention of self-defense and justifiable homicide, but the officer must allow the subject enough rope, just in case.

A very basic, but vital, point is checking out the details of an "intruder" incident. Two questions that arise are whether the intruder had a criminal record and whether the deceased and the defender had known each other.

MENTAL STATE

The "insanity defense" sometimes comes up in court, and the investigating officer should be prepared to substantiate his view of the offender's mental state. While an investigating officer cannot qualify as an "expert witness" in the same sense as a psychiatrist can, he has the incomparable advantage of having

been on the scene during the early stages of the case. The defense psychiatrist can only testify regarding the results of his examination, some time after the crime, and pass an opinion about the accused's mental state when he committed the act. This retrospective opinion-forming isn't as solid as many think it is, because in any criminal trial with an "N.G.R.I." defense there are usually two panels of psychiatrists. One panel testifies that the subject is insane; the other says "no," with members of each side tailoring their opinions to suit the needs of the party paying their fees.

What the investigating officer can do is observe and record the suspect's words and actions, in order to testify later whether or not the suspect appeared to understand what was being said to him, and whether he answered questions logically and coherently.¹ The officer should note whether the suspect appears to be rational at the moment, and whether he appears to be under the influence of alcohol or drugs.

This point is also important when interviewing witnesses. They, too, can make observations regarding the suspect's rationality, and these opinions may count later in court.² In some cases, the officers and witnesses won't be allowed to state their opinions as such, because they're not expert witnesses, but a prosecution psychiatrist can render an opinion regarding the suspect's mental state based upon testimony from officers and other witnesses.

AUDIO AND VIDEO TAPE

Documenting the suspect's mental state is a very good reason for using a tape recorder. This provides objective evidence of the suspect's speech pattern, and his ability to respond to questions and carry on a dialog. Playing back a tape of the suspect's logical

and coherent answers to questions can destroy a defense claim that he was insane and incoherent at the time of the offense.

Videotape is particularly impressive in court. There are some precautions to take when recording a suspect's confession on either audio or video tape. The first is to recite the Miranda Warning to the suspect on the tape, and to ask if he understands. Next is to ask him if he waives his right to remain silent, and to record his answer. Finally, it's necessary to advise him that the session is being recorded, and to ask him if he consents to that. Once all of these assents are on tape, the suspect may proceed with his confession.

Probably the most important reason for videotaping a confession is to counter a defense attorney's repudiation of the suspect's confession or accusation of a forced confession. A videotape can show graphically that the suspect spoke freely, without having his arm twisted, and it forestalls any false accusations.

AUTHENTICATING THE CONFESSION

Occasionally, there are false confessions. These come about in one of three ways.

A suspect may cave in and confess to the crime as a result of fatigue, or the emotional pressure of a relentless interrogation. Even with the Miranda Warning, and today's emphasis upon the rights of the accused, it's possible for an over-confident investigator to push too hard, and elicit a false confession.

A person may confess to a homicide to protect someone else. This situation can be very hard to unravel, especially if the person confessing was on the scene with the perpetrator and knows the details of the crime. Paving close attention to possible motives can help clear the air in this type of case.

Compulsive "confessors" turn themselves in when there's a highly-publicized murder. The number of confessors who walk in depends on the sensation accompanying the crime and the size of the city. A horrendous sex murder attracts confessors. Large cities appear to have more of the mentally deranged types who come to confess.

Precautions

As a precaution against false confessions, it's vital to retain certain "investigative keys." These are important details of the crime which the investigator does not release to the media, and which serve to authenticate a confession. Details may concern the position of the body, in which room the body was found, the location of injuries, clothing worn by the victim, etc. These are details which only the suspect would know, in principle.

In practice, it's not always that easy. Usually, someone finds the body and reports it. Others may see the crime scene before the police arrive. If the homicide occurred in a public place, there's not much about the crime that can be kept secret. If it's a shooting, withholding the number of shots fired into the body may not be as useful as it seems at first, because in the heat of a shooting it's hard to keep count of shots fired.

Confessors are another problem, but because these people are often very obviously deranged, it's easy to detect that their confessions don't hold up to serious examination. Detectives who see the same person confessing to a series of crimes soon learn to spot the time-wasters. As a precaution, it's worth taking their fingerprints and photographs, for the information of investigators in future cases.

PHYSICAL SEARCH

It's normal police procedure to handcuff and to search a felony suspect, but in a homicide investigation, just as in a rape

investigation, there may be physical evidence that requires special handling. This is why the homicide investigator or an evidence technician should assist in the search.

Even with a confession, it's wise to obtain physical evidence as a fall-back position if the suspect repudiates his confession. Careful collecting and labeling will help ensure that the physical evidence links the suspect to the crime.

As with the crime scene, time is important. Not only does physical evidence tend to deteriorate, but the suspect will probably try to destroy it. He may, for example, wash blood off his hands or clothing. This is why it's vital to get the search of the suspect underway quickly, before he is allowed to go to the bathroom.

The first step is to photograph the suspect. A Polaroid camera will do if nothing else is available, but a 35mm camera loaded with color negative film will preserve the suspect's appearance in more detail. As well as documenting evidence, photographs can forestall imaginative defense claims. A defense attorney might claim that bruises on the suspect came about during custody, but if a photograph taken immediately after his arrest shows the bruises in place, this claim won't hold water.

Common sense must rule the gathering of evidence from the suspect. Superficial injuries that indicate a struggle are evidence, and it's vital to photograph these before they fade, and before any treatment. Whoever takes the photographs should make a written record of each frame, and what it depicts, in his notebook.

It's important to search the suspect thoroughly, and not to take anything for granted. A strip search in the interrogation room is best. The suspect may wear jail-issue clothing, as his own clothes require close examination. A strip search also allows noting any marks or bruises on his body. In a homicide-rape, blood on the suspect's genitals is a significant finding, and

the investigator should immediately secure a sample for evidence.

Blood on the clothing may be the suspect's or the victim's. This is why it's important to preserve clothing for laboratory examination. Blood on the suspect's skin also may be the victim's, especially if the suspect has no injuries to explain the blood. Obtaining a sample of this is simple if the blood is fairly fresh and not completely clotted. A tongue depressor serves to scrape the blood from the subject's skin, after which it can go into a plastic bag.

There are two methods to obtain samples of dried blood. One is to scrape off some flakes. The other is to moisten the clot with a swab dipped in distilled water, and to sop it off with the swab or with a gauze sponge. The preferable one is to scrape the clot off with a dull blade, such as a metal spatula or wooden tongue depressor. This may not be possible if the clot is in a sensitive area.

Other substances may link the suspect to the crime scene. Mud on the shoes may match mud near the scene. Special conditions at the scene point the way to certain substances. Metal filings and chips are normally on the floor of a machine shop. Fresh paint at the crime scene may have clung to the suspect's clothing or shoes.

In a shooting, swabbing the suspect's hand with a 5% nitric acid solution to obtain powder residue may be worthwhile. The test for powder residue, by neutron activation analysis, or atomic absorption, can detect antimony, barium, and lead, which are elements normally found in propellant gas when a cartridge fires.³ However, a positive reaction does not prove that the suspect fired the weapon.* The main practical value of this test is as leverage to persuade a suspect to confess.

If the suspect has a vehicle, it's critically important to examine it, whether or not there's reason to believe it was near the crime scene. If the vehicle served as transportation to or from the crime scene it may contain various types of evidence. A weapon may be hidden under the seat. Blood may have transferred off the suspect's clothing or shoes onto the seat or carpet. The suspect may have wiped his hands on a rag or towel, and left it under the seat or in the trunk. If the victim was in the vehicle with the suspect, there may be evidence linking the victim to the vehicle. This may be a wallet, or only trace evidence, such as fibers.

Close liaison with the forensic laboratory will help extract the maximum possible from the suspect's physical evidence. For best results, though, it's vital to ensure that investigators label and identify correctly every piece of physical evidence sent for analysis. Documenting this with entries in the investigation log or notebook will help nail it down.

SOURCES

1. Practical Homicide Investigation, Vernon J. Geberth, New York, Elsevier Science Publishing Co. Inc., 1983, p. 82.
2. Ibid, p. 83.
3. A Practical Guide to the Basics of Physical Evidence, Claude W. Cook, Springfield, IL, Charles C Thomas, 1984, p.22.
4. Practical Homicide Investigation, p. 159.

IDENTIFICATION OF THE VICTIM

In most homicides the identity of the victim is self-evident or easily found. Because the death is a criminal matter, it's important to verify the identity by several means. Knowing the victim's identity allows exploring collateral information, such as possible motives and suspects.

In some cases, the victim's identity isn't clear. This is especially true of bodies discovered in remote areas, badly mutilated or decomposed bodies, and bodies found in public places without identifying documents or supporting witnesses. Killers sometimes try to hide their crimes by disposing of bodies in places where they're not likely to be found. Others try to obscure the evidence by dissecting a body and disposing of the pieces in several locations. Some merely decapitate a body and cut off the fingers to prevent identification.

Some killers are very thorough in mutilation of their victims, dismembering the body and leaving parts over a wide area. In a rural area, investigators may never find the entire body. There have also been a few cases of killers mailing or shipping parts of their victims to other cities, using real or fictitious addresses. This can be very troublesome, because although body parts are always cause for suspicion, putting them together to ascertain the identity of the victim is very difficult.

An especially difficult type of killing to track is one in which the killer dismembers his victim and drops the parts into dumpsters, refuse cans, or incinerators. In certain cities, newborn infants or aborted fetuses wind up in incinerators because their small size makes it easy to slip them down the chute. When this happens, the killer often gets away with it, because nobody ever notices the small cremated skeleton amid the rest of the debris.

In other cases, the victim is a transient or drifter, unknown in the area, and without identifying documents. The victim may be known to other transients, but not necessarily by his true name. This limits the usefulness of interviewing transients in the area. Unless the victim's fingerprints are on file somewhere, identification is almost impossible without a lucky break.

At times, the method of killing makes identification very difficult. An example is burning the victim, which in extreme cases leaves only charred bones. Other circumstances of the crime can combine to make identification difficult, as when juveniles pour gasoline on a sleeping transient or "wino" and set him aflame. Identities of "street people" or homeless people are often unknown, and burning can destroy a wallet.

Yet another problem is the killer who tries to disguise the crime. Taking the victim's wallet suggests a mugging rather than a premeditated murder. A vehicular death might be a simple hit-and-run, or a planned murder.

Americans are very mobile, and many move to another state at some time during their lives. Some do this to leave a troublesome past behind. At times, a victim's identity may turn out to be quite different from that known to his friends and neighbors. A prison record may turn up, or the individual may be a fugitive. Thus, the task of pinning down a victim's identity can be very uncertain and laborious, depending on the circumstances. Let's proceed from the simplest to the more complex methods:

IMMEDIATE CIRCUMSTANCES

The victim may be known to people in the area, such as neighbors or fellow employees. Family members may identify the body. This sort of identification serves as a starting point for further investigation.

DOCUMENTS

If the victim has a wallet, there should always be an examination of documents inside. It's not enough to copy the information into a notebook. If the document is a driver's license, there should always be a check with the bureau of motor vehicles to verify that a license with that number belongs to a person of that name. Likewise with birth certificates, cards, and other I.D. There's enough traffic in forged and stolen I.D. to make this necessary.'

FINGERPRINTS

Another routine step is to take the cadaver's fingerprints and forward them for a check by the FBI. This is another routine and mandatory step. Getting a reply may take a long time, though.

Taking a cadaver's fingerprints requires a "spoon," a concave device to hold a fingerprint card to fit around the finger. Post-mortem fingerprinting can take place at the scene, after the medical examiner finishes his work and before transporting the body to the morgue. At times, the fingertips will be shriveled, making the taking of prints the normal way impossible. With decomposition, the skin begins to separate from the underlying tissues.

Restoring the skin to enable taking fingerprints depends upon the state of the fingers. Injecting oil or glycerin into the underlying tissues can restore shriveled or wrinkled skin. In extreme cases, such as if the body has been immersed in water, the skin may be very wrinkled. One way of coping with this is cutting and peeling the skin. Placing it over one's own finger, will allow obtaining a print using the regular ink pad method. It's advisable to wear a glove when doing this.³

If the body is mummified and dried out, it will be necessary to cut off the fingers and place them in a solution of water and ethylene glycol, or water and glycerin, to soften the skin. This is a task for the medical examiner and the identification technician.

PHYSICAL CHARACTERISTICS

Listing and photographing the victim's physical characteristics is a basic step, because these can help narrow down the search.

The bare minimum should be the features normally listed for "description" in a missing person report. These include height, weight, scars, tattoos, and other identifying marks. The victim's race is important, but may not be identifiable at first if the body is badly decomposed. An autopsy can determine the victim's race by analysis of the bones of the skull.

Reconstructing the victim's medical history is often possible, especially with a fresh corpse. A start is to list surgical scars and to photograph them if time allows. X-Rays will show any healed bone fractures.

TEETH

Teeth can link an unknown victim to an identity. The victim's teeth contain the entire dental history, and the pattern of fillings can often establish an individual's identity beyond doubt. This is why it's important, in cases of doubtful identity, to record the state of the victim's teeth as thoroughly as possible. This requires skills beyond those of an identification technician.

A forensic odontologist can perform a competent examination of the victim's teeth. Information regarding the nearest forensic odontologist is available from:

The American Board of Forensic Odontology, Inc.
Administrative Office
The Forensic Sciences Foundation
11400 Rockville Pike
Rockville, MD 20852

Even when the victim is badly burned or decomposed, and consists only of a skeleton, the teeth can provide a good deal of information. As a start, it's possible to estimate the victim's age from the teeth. It's often possible to gain information regarding the nationality from the type of dental work done. Stainless steel teeth, for example, are the hallmark of iron curtain dentistry.

The presence of extensive and expensive dental work suggests that the victim was able to afford it. Socio-economic information sometimes helps in narrowing the search. Personal habits, such as smoking and nail-biting, leave traces on the teeth. The mouthpieces of some musical instruments, such as the trumpet, leave characteristic wear patterns on the front teeth, as does holding a pipestem between them.

The bad news about identification from teeth is that a positive identification is possible only when there are possible matches. There is no national file system of teeth patterns and dental histories. Only when it's possible to focus the investigation onto a few "possibles" can a dentist examine the unknown and compare it with the dental histories and X-Rays of those on the list.

SKELETONS

The skeleton can reveal a person's height, build, age, sex, part of his medical history, and race. The long bones have a definite ratio to the person's overall height. The skeleton also shows the general build. Changes in bone structure occur throughout life. During the early years, growth is the main event, and the medical examiner can estimate age by several anatomical features which change greatly during the growth period. The fontanel, or "soft spot," fills in within a year after birth. The other seams in the skull, called "sutures," fill in during the third decade of life. Calcium deposits proceed throughout life, and these allow estimating age.

It's also possible to reconstruct facial features from the skull. Using a mix of scientific information regarding tissue thickness over various areas and artistic guesswork, the sculptor can rebuild a rough likeness of the victim's face. Applying a wig and eyebrows helps complete the features. Photographing the

reconstructed head and distributing photographs to the media can help identify the victim when nothing else has worked.⁴

MISSING PERSONS

Most missing persons cases are voluntary departures without sinister overtones. Occasionally, a missing person becomes the victim of a crime far from home. With an unknown victim, checking out the missing persons files is a necessary step.

Matching an unknown victim to a reported missing person is becoming more practical today. Previously, there had been little hope of help from this area for several reasons. One, which we still find today, is that leaving home is not a crime for adults, and is only a "status offense" for a child. This results in missing reports getting low priority from police agencies. Another is that some missing persons are never reported to the police. This is a likely happening in a marital dispute when one partner is happy to see the other leave. Finally, the fragmentation of American police has worked against free exchange of information and the establishment of any sort of clearing house for missing person information.

Today, there are several factors helping correlation of unknown homicide victims with missing persons. One is the centralization of information about missing persons, especially children. While it's true that the missing child problem has been overstated and sensationalized by the media, and few missing children wind up murdered, having a central clearing house helps in the exchange of data.

Medical records are in better shape than ever, and a missing person report is more likely to have accurate information about the subject's medical history than ever before. This makes recording an unknown's apparent medical history critically important. Affecting this is a uniquely American characteristic.

Americans are about three times as likely as other nationalities, among industrialized countries, to have had surgery. Overall, this helps identification. Although some surgical scars, such as circumcision and appendectomy scars, are so common among Americans as to be almost useless as identifying features, the combinations of operations can narrow the field somewhat. Examination of the victim can allow estimating the age at which each operation occurred, which helps to match characteristics of possible missing persons. Adding to this other and more exotic procedures, such as various forms of plastic surgery, allows eliminating many "possibles." Although it's not always possible to obtain a positive I.D. through medical history alone, it can be very helpful.

Some agencies already have their missing persons records computerized. With the information in a database, obtaining a match on the basis of partial information becomes a manageable task. Even with a million entries, it's possible to narrow the field greatly simply by extracting records based on age, sex, and blood type. The more details are available, the better the chances of eliminating "possibles" and bringing the number of cases to examine manually down to a realistic number.

FUTURE PROSPECTS

Although most homicide victims are easy to identify, a disturbing minority remain unknown. Modern forensic techniques are helping to reduce this proportion, and a couple of breakthroughs are around the corner. One is a national missing persons computer network, which may hold millions of records in great detail, and permit scanning for possible matches in seconds or minutes.

The other breakthrough is a necessary outgrowth of the first, a national standard for identification characteristics. This will provide a checklist for investigators to seek out and record

information about identifying characteristics of people involved in various situations, not only homicide victims or missing persons.

Finally, one breakthrough is already here. The VICAP system allows working the problem from the other direction, checking missing persons against unidentified homicide victims.

The picture for the future is very bright. While improving the prospects of identifying victims won't by itself change the overall situation, it will improve the odds of finding the perpetrators.

SOURCES

1. New ID. In America., Anonymous, Boulder, CO, Paladin Press, 1983.
2. Methods of Disguise., John Sample, Port Townsend, WA, Loompanics Unlimited, 1984, pp. 102-112.
3. Fundamentals of Criminal Investigation, Charles E. O'Hara and Gregory L. O'Hara, Springfield, IL, Charles C. Thomas, Publisher, 1981, p. 681.
4. Practical Homicide Investigation, Vernon J. Geberth, New York, Elsevier Science Publishing Co. Inc., 1983, p. 213.

Geberth also lists a source for forensic sculpturing:

SKULLPTURE, INC.

1026 Leslie Lane

Norman, OK 73069

FORENSIC MEDICAL EXAMINATION

Cause of death isn't always obvious, and at times it's very hard to determine correctly at the scene. The body may have bruises, broken bones, and other marks of violence, but the homicide investigator can't, by himself, determine that these caused death or even contributed to it. Only an autopsy can disclose hidden brain hemorrhages that may have caused convulsions. A body may show no signs of violence at all, and yet the cause of death can be anything but natural. Only an autopsy and chemical analysis can positively confirm the presence or absence of poisons, for example.

Although it's been slow in coming, the idea that a forensic medical examiner should inspect the body on the scene and perform an autopsy as soon as possible afterwards has finally taken hold. Traditionally, a verdict on manner of death has been the coroner's job, but this post was often that of a political appointee or an elected official with no special skills in forensic examination. At times, the coroner would ask an opinion of the local doctor, usually a general practitioner, and the most that we can say about this is that it was better than nothing. Later, pathologists entered the field, leading to the modern forensic specialist.

The modern medical examiner is a pathologist who has taken special instruction in forensic techniques and requirements. A

pathologist without the specialized knowledge is qualified to determine the cause of death when it's a normal pathological process, such as pneumonia or cancer. A forensic pathologist specializes in questionable or violent deaths, and has developed special skills such as the ability to estimate time of death in various situations. He's served an apprenticeship with an established medical examiner's department, and is probably a member of the National Association of Medical Examiners. This organization's address is:

1402 South Grand Boulevard

St. Louis, MO 63104

Att: Dr. George E. Gantner, Secretary-Treasurer

Phone:(314)577-8000

An important point is that a forensic medical examination is necessary in any case of doubtful death. "Doubtful" means any instance in which the victim was not under a doctor's care for the condition that brought about death, or when there's any suspicion regarding the manner of death. In the past, people literally got away with murder because homicides passed for natural deaths or accidents.

Another important point is that, for best results, an autopsy comes before embalming and burial. While it's possible to exhume a body at a later date, the chances of finding anything significant drop greatly after customary embalming and burial. The reason is that embalming involves cleaning the body, thereby destroying what might be trace evidence, and draining the blood, replacing it with embalming fluid. This also destroys evidence. Subsequent changes also can mask or destroy evidence regarding time and cause of death, and other pertinent facts.

ON THE SCENE

There is no doubt that on-the-scene forensic medical examination is mandatory. A later autopsy can often nail down the cause of death and provide many details unavailable at the scene, but the preliminary medical examination serves several purposes:

1. It provides an educated opinion regarding the cause and time of death. Experienced homicide investigators are not forensic pathologists, and although they can often make very good educated guesses, a second opinion from a qualified person helps a great deal. A pathologist can often tell if injuries seen on the victim occurred before or after death, for example. Homicide investigators don't usually carry thermometers, but the medical examiners do, and these serve to make a time of death estimate more accurate.
2. Time is of the essence, and having forensic medical information on the scene often helps direct the investigation. A quick opinion, delivered on the scene, often helps the investigator more than a detailed and well-reasoned opinion unavailable until the case is several days old.
3. The medical examiner on the scene can gather his own evidence, such as tissue or serological samples, handle them in his own way, and preserve them for later examination.
4. Although a forensic pathologist can determine many details with an autopsy, it's often helpful for him to see the scene for himself. The medical examiner is looking for medical information. The homicide investigator mainly looks for criminal evidence. Criminal investigators don't

always gather all of the subtle details of information the specialist needs, and this can delay progress.

The homicide investigator should do everything he can to facilitate the forensic pathologist's job. This especially includes getting crime scene photographs and sketches completed before the medical examiner arrives. Photographs usually don't delay the proceeding by much, but sketching takes longer, and one way to speed up the process is for the detective doing the sketches to work from the inside out. Once he has sketched in the walls, he can take measurements of the body's position, note weapons and other objects near the body, and sketch in furniture and other peripheral objects in his own time.

The homicide investigator should work closely with the medical examiner, filling him in on events up to his arrival.¹ He should tell the M. E. of any work done on the body, such as attempts at resuscitation. This will help the medical examiner avoid erroneous conclusions. If there's reason to believe that the killing took place elsewhere, and the homicide investigator knows where it is, he should bring the medical examiner there to inspect the scene, especially if there's visible evidence of homicide, such as blood stains or weapons.

Sometimes, the medical examiner can help determine if the victim's death took place at the crime scene. If the manner of death caused bleeding, the medical examiner can determine if the total blood spilled and the blood remaining in the victim's body add up to the normal amount for a person of that body weight. If there's much less volume than expected, this suggests that the victim bled elsewhere, and was moved to the place where found.¹

While the medical examiner is inspecting the body, the investigator can take notes of any significant findings. He should also be prepared to take photographs of anything the pathologist finds, such as wounds, bites, scars, and tattoos. Scars and tattoos, especially, can help identify an unknown body, or confirm the

identity of one that's been tentatively identified. The investigator should also be ready to secure anything that serves as evidence. For example, the medical examiner may turn the body over, and a bullet may fall out of a wound, or become visible where it lay under the body. The victim may have pieces of his assailant's skin under his fingernails if there was a struggle. This is why the investigator should have his evidence kit close by while the medical examiner inspects the body.

The medical examiner should perform an autopsy as soon as possible. For this, he'll need to transport the body to his facility, and will probably have his own staff and truck for this. The investigator, or an assistant who's been at the crime scene, should accompany the body to the morgue or medical examiner's office. This is both to maintain the chain of custody and to answer questions the medical examiner may have. Another purpose is to make immediate use of any evidence recovered, such as bullets. Finally, the investigator can solicit a verbal opinion from the medical examiner, and not have to wait for the written report. This is important, because when there's a heavy work-load, the paperwork doesn't keep up with the progress of the case.

A vital point is to preserve the body from contamination during transport. This usually means placing the cadaver in a plastic "body bag" before moving it. Another precaution is to place paper bags around the hands to preserve any evidence on the hands.

THE AUTOPSY

The autopsy proceeds in several stages, to obtain the most information possible in the most efficient manner. The first step is to remove clothing. Clothing on the body often bears evidence of a struggle or of injuries. There may be knife slashes or bullet

holes. The medical examiner will check these out in relation to the victim's injuries.

Next, the autopsy surgeon will record the gross physical measurements, such as height and weight. Next comes a series of X-Rays, to detect any hidden injuries or abnormalities. An X-Ray can, for example, pick up traces of an old fracture, which can help identify an unknown cadaver. Bullets, pieces of broken blades, and other foreign objects inside the corpse show up on the X-Rays.

The autopsy itself, involving partial dissection of the body, can reveal much more information. The medical examiner notes all scars, wounds, and other marks on the body. Recording old scars and injuries is especially important in the case of an unidentified subject. It may eventually become necessary to match these with a putative subject's medical history.

The forensic examiner inspects each injury and forms an opinion regarding the type of weapon which produced it, and whether or not it was the fatal wound.³

Patterned injuries are those which bear the marks of the weapon or instrument which inflicted them. A rope around the neck, for example, leaves an impression of its weave. Likewise, strangling with a belt impresses the skin with a mark the width of the strap, and if the buckle contacted the skin it also leaves its mark. In blunt trauma, it's often possible to pin-point the size and shape of instrument which produced it, and if it broke into or through a bone the instrument leaves a hard trace of the blow. Stab wounds often allow estimating the size of the blade.

Previous injuries can be very important, especially in child deaths. A characteristic of child abuse cases is that the child has scars and marks that point to a history of child-battering. Evidence of healed injuries is important when confronting and interrogating a parent or guardian who denies that the child had been previously injured.

The medical examiner starts at the head, looking for both obvious and hidden injuries. An important point, if the body lacks identification, is to examine and X-Ray the teeth meticulously, as these can be the basis for identifying the victim. The surgeon then opens the skull and examines the brain case, also removing the brain and retaining a section for later examination.⁴

The medical examiner then opens the chest and abdomen, examining the underlying tissues and ribs for evidence of injury. He examines the internal organs for abnormalities and injuries, taking tissue samples where appropriate. An important point is the stomach contents, as their condition, when coupled with the time of the last meal, can help determine the time of death. It's also necessary to check out the lower intestinal tract and the genitals, especially in sex cases, because these can show evidence of injury. Swabbing the genital and anal areas, as well as the mouth, for traces of semen, is an essential part of the autopsy unless it's possible to rule out sexual aspects right at the start. Swabbing for semen should take place without fail in every strangling death, because a ligature around the neck is the way some sex criminals control their victims.

Injuries and mutilations of the genital area are always worth noting and photographing. Members of homosexual and sado-masochistic subcultures use "cock-rings," leather straps or metal rings, fastened around the base of the penis and testicles, to enhance sexual excitement. While not harmful in themselves, these devices can provide investigative leads. Another type of sexual appliance is the needle or ring inserted into the penis, in a process known as "infibulation." A metal ring passed through the urethral opening and coming out of the bottom is called a "Prince Albert," and usually indicates a sado-masochistic subculture because cutting into the urethra and insertion of the ring are done without anesthesia by non-medical people. Some devices are elaborate, fashioned of precious metal and inset with jewels.

A very valuable part of the autopsy is the "tox screen," a procedure that tests the corpse's blood and organs for drugs, self-administered or otherwise. This can be very important because alcohol and various legal and illegal drugs play important roles in homicides today. The tox screen tests for a whole range of drugs and foreign substances, and can provide a quick answer to some perplexing questions.

The forensic pathologist may also be able to provide information regarding the victim's position when killed, whether a particular wound occurred before or after death, whether the body was moved after death, and whether there's any trace of sexual assault. He can also deliver an opinion regarding how long the victim lived after the fatal injury. These details can be crucial in an investigation.

THE AUTOPSY REPORT

The autopsy report should be very complete, covering everything significant, because at times unexpected developments in the case make previously unimportant details assume greater importance. This is a vital point, because an autopsy is basically a one-shot deal. Once the body is released to relatives, it may be embalmed or cremated, and these make any further examination very problematical.

The homicide investigator should be aware that a one-page autopsy report is the hallmark of the incompetent or lazy practitioner. It's never possible to produce a complete report with only one page. It may be desirable to write a summary to introduce in evidence, but the rest of the data gathered during the autopsy should be available in a complete report if needed.

SOURCES

1. Practical Homicide Investigation, Vernon J. Geberth, New York, Elsevier Science Publishing Co. Inc., 1983, pp. 76-78.
2. Fundamentals of Criminal Investigation, Charles E. O'Hara and Gregory L O'Hara, Springfield, IL, Charles C. Thomas, Publisher, 1981, p. 515.
3. Practical Homicide Investigation, pp. 347-351.
4. Ibid., pp. 357-362, provides a set of very explicit black & white photographs showing exactly how the autopsy surgeon opens the skull and removes the brain.

CANVASSING FOR INFORMATION

A necessary step in seeking information is to canvass people who live or work near the crime scene. The percentage of people interviewed who have anything to contribute is always disappointingly small, but the purpose is to find one star witness, not to collect an audience. This is why canvassing is a series of screening interviews, with the emphasis on questioning briefly everyone who might have seen or heard anything significant.

A major point is that modern technology and tools have expanded the nature of the traditional face-to-face canvass. As we'll see, several techniques of using electronic canvass are gaining acceptance because they've brought forth results that would have otherwise been difficult or impossible to obtain.

WHAT CAN CANVASSING DEVELOP?

At the outset, there's no way to ascertain what sort of information will come out of a thorough canvass. There can easily be surprises. Someone living in the area may have seen the crime itself, or seen one or more of the participants. Someone may be acquainted with or related to the victim or suspect.

CANVASSING TECHNIQUES

Canvassing isn't a casual task to assign to anyone who happens to be available. Canvassing requires dedication, intelligence, motivation, and skill in dealing with people. The officers assigned to canvassing should have a clear idea of the information they should try to elicit. Basic information is as follows:

- Name.
- Address.
- Telephone number.
- Work address and telephone.
- Was person present during the crime?
- Did the person see or hear anything?
- Does the person know either the victim or the suspect?
- Names of any others at this address.
- Names of any visitors during the period of the crime.
- Convenient time for another interview, if necessary.
- Witness's travel plans, if any, for the immediate future.

This short list serves for screening potential witnesses. The canvasser should work quickly, screening each person and moving on. He should note every interviewee's answers and keep a list of people he missed.

The best time to canvass is at about the same time of day as the crime occurred, on the basis that the same people are most likely to be on the scene. In a business district, it's pointless to canvass after closing time for information relating to a crime that took place during working hours. Likewise, in a residential area, the best shot at finding witnesses comes at about the same time

as the homicide. However, common sense also counts, and officers who wake people in the middle of the night to answer questions that could have waited until morning will arouse resentment.¹

The "callback list" of people missed during the first attempt is important. Some people are out on errands when the officer first calls. Others may be at work, but there's always the off-chance that they were home sick the day of the incident, and may have something to contribute. The canvass isn't over until officers have seen and interviewed everyone in the area, or established a firm reason regarding why they're not available.

CANVASSING AREAS

The question of how far afield to go with the canvass is hard to answer categorically. The rule of thumb for making a quick decision on the initial canvass is to stand at the crime scene and look around, assigning canvassers to every building which overlooks the crime scene. This is only good for the first stage, because reconstruction of the crime may reveal that some of the action took place some distance away, justifying another canvass. For example, if officers find a soft-drink container from a convenience store at the scene, it's logical to wonder if it belonged to the victim or to the suspect. This makes it worthwhile to check out convenience stores for several miles around, asking if clerks recognize photographs of the victim. If officers find any who do, they should ask the witnesses if anyone was with the person, what the person did, and in which direction did he depart.

AUTOMOBILES

It's important to record the makes and plate numbers of all automobiles within sight of the crime scene. Obtaining the

names and addresses of the owners can wait until additional help is available to request the information from the motor vehicle bureau, but getting the basic information down on paper quickly is vital because automobiles can be moved.

FOLLOW-UP INTERVIEWS

Once the homicide investigator has the results of the canvass in his hands, he can decide on follow-up interviews. In some instances, it won't be necessary because the investigator has taken part in the canvass and gotten all of the information he needed from those he interviewed.

A "quality" interview is one in which the investigator can obtain definite information regarding the crime. This can be an eyewitness, who can testify regarding who committed the crime, at what time, and how. Another type of quality witness is one who can provide information regarding motive. For example, a witness who testifies that a married couple had had frequent altercations and that the issue was one partner's infidelity, provides information useful in building the case. Yet another type provides information regarding evidence, such as one who lent the suspect a weapon.²

SOLICITING ADDITIONAL INFORMATION

A common practice today is for a police agency to maintain a special telephone line for information, usually under a name such as "CRIMESTOP," "CRIME HOT LINE," or "SILENT WITNESS." An informer can call in to disclose information about a crime. Originally, these were "ad hoc" numbers, assigned only for specific investigations. Police agencies resorted to this method when they'd run out of leads from other sources

and were faced with the prospect of a dead-end case. However, they've produced enough good information to make them worth operating all the time. Some are even toll-free 800-numbers with catchy names, such as "800-HOT-LINE," or "800-WITNESS."

The number may be a 24-hour line, with a live operator to answer, or a taped message telling the caller what times to call back. Smaller agencies may not have the personnel to keep the line open 24 hours a day. Because of the situations and the nature of the calls, persons rarely leave their numbers.

The question of cash reward often arises. While some people will inform for personal motives, such as public-spiritedness or revenge on the person they're revealing, cash is also a powerful incentive. This can bring forth information that otherwise would have remained buried.

The amount of payment offered varies. Many departments have a limit of five hundred or one thousand dollars. Payment will depend on the importance of the case.

The source of payment also varies. A police agency may offer money, but a private individual or a company can also offer a reward. The amount can be quite large, depending on the importance of the case and the financial resources of the party fronting the money,

A few ground rules are important to soliciting information this way. The first is that the police will make no payment until they check out the information and find it valid. The second is that police officers and their families are not eligible for rewards. Another is that all information must go directly to the police, not an intermediary, such as a newspaper. This last rule is hard or impossible to enforce if another party is paying the money.

In certain cases, the form of payment required will be hard to fulfill. The informer may request immunity for a crime, or payment in drugs. This comes down to local practice and

individual conscience. Immunity for a crime already committed is often a matter of trading a "little fish" for a "big fish."

In certain jurisdictions, payment in drugs is standard practice if no other choice exists. It's naive to offer money instead, because the informer will only spend it on drugs, and the indirect effect is that the police are subsidizing part of the drug traffic by contributing to a dealer's livelihood. It's better all round to offer confiscated drugs to the informer. One side-effect of payment in drugs is that it cuts into a dealer's business. Another is that it prevents several property crimes, which the drug addict would have committed to obtain money to feed his habit. The officer who dispenses drugs in this way must, of course, understand that it's illegal, and that it's essential to have tacit support from his superiors before considering such a payment. Tacit support means that they will look the other way while the officer diverts confiscated drugs to this purpose. Few of today's police chiefs will support such practices, which is one reason why the enforcement effort against the drug traffic is ineffective.³

TELEVISION

There have been several attempts at soliciting information from the public through television. The old FBI show had a segment devoted to this. Recently, another television program called *America's Most Wanted* has aired, and resulted in the capture of several murderers. *America's Most Wanted* does not run descriptions only of killers. There was a child molester and a serial rapist featured, as well as others who had committed other crimes. The ratio of apprehensions has been encouraging, standing at almost 50% at this time (late 1988).

The problem is that this is a weekly show, limiting it to only a few cases per year. An unsolved murder simply may not "rate" or have enough shock value to appear on the show. However,

if the murder is sensational enough, there's a fair chance of its inclusion.

Local TV stations often run "wanted" segments in cooperation with the police. These are often ad hoc, or temporary, but they sometimes get results. Television exposure is a choice to keep in mind for dead-end cases.

MOTIVES

Information regarding motive for homicide can come about through the canvass. This is as good a place as any to explain problems with ferreting out motives.

An obvious question to ask all relatives, friends, and acquaintances of the victim is: "Do you know of anyone who might have had a reason to kill him?" The only motive useful to the investigator is one that points to a specific person. This is a "linking" motive, and accounts for "personal" killings. A motive such as robbery is an impersonal one, and doesn't necessarily point to a single individual.

Also affecting the picture is the victim's lifestyle. The "low-profile" victim leads a very private life, has few friends or acquaintances, and stays away from what might be dangerous activities. Seeking out a motive with this type of victim is often fairly simple, because there aren't many possible killers or motives.

The victim who leads a "high-profile" lifestyle, by contrast, presents investigators with several problems. A high profile means engaging in many overt and controversial activities, such as dealing in drugs, membership in organized crime, holding public office, or having many sexual and/or non-sexual but

intense relationships. High profile activity expands the possible suspect list and increases the investigator's work-load.

A linking motive that can cause problems is revenge, in the case of certain people. Revenge for an affair with one's wife can be a motive for murder, but if the victim was unusually promiscuous, and had affairs with several wives, including some of whom the investigators are not aware, the case becomes clouded.

Another type of pitfall in seeking the motive is the "wild card." This is the unperceived or unsuspected motive, masked by a very obvious one. An example would be the gang leader killed by a jealous husband. The obvious motive is gang rivalry, but this can be misleading. Likewise, a prostitute may be brutalized and killed by an otherwise unconnected serial killer, as well as by a sadistic customer or pimp.

Discrimination between the obvious and the wild card motive requires close attention to detail. Close examination of the facts of the case can reveal that the obvious motive, however compelling, has no collateral evidence. This alerts the investigating officer to be cautious, and to seek another, less apparent, motive. Soliciting and checking out alibis can help reduce the suspect list.

QUICKSAND

Traditionally, police investigators have concentrated on information, rather than physical evidence, to make the case and to provide investigative leads. Handling information is an art, not a science, and investigators must distinguish between valid and invalid information. Informants and informers often have axes to grind. Witnesses, even impartial ones, often differ in their accounts, especially regarding descriptions of suspects.

These problems offer severe obstacles and interesting challenges to the homicide investigator. Carrying an investigation to a successful conclusion requires both intellectual acuity and emotional stamina.

1. Practical Homicide Investigation, Veraon J. Geberth. New York, Elsevier Science Publishing Co. Inc., 1983, p. 74.
2. Fundamentals of Criminal Investigation, Charles E, O'Hara and Gregory L. O'Hara, Springfield, IL, Charles C. Thomas, Publisher, 1981, pp. 573-574.
3. It's very difficult to find documentation of paying for information with illegal drugs, for obvious reasons. Experienced police officers often hear through the grapevine how some investigators divert part of a drug haul instead of logging it in as evidence. Intercepting drugs before they enter the custodial chain, with its paperwork trail, is simpler and safer than purloining it afterwards.

The disappearance of the drugs of the "French Connection" case two decades ago in New York City is an example of an illegal substitution which could not remain undiscovered indefinitely. It presented agonizing legal and public relations problems for the New York Police. If in fact officers purloined the drugs for paying informers and not for personal profit, they chose the worst possible way to do it.

It's safer to divert drugs at the outset, during the arrest. Listing a smaller quantity on the property sheet covers the appropriation, and the suspect is unlikely to protest because a larger amount often results in a heavier charge or sentence.

Another time for diversion is during drug destruction, after the drugs have served their purpose as evidence. There are often strict controls over the method of destruction. These include having at least two senior police officials present to supervise the burning of the drugs. If all who are involved are of like mind, it's possible to divert enough to cover informer operations in the near future.

WORKING THE CRIME SCENE

Despite all of the precautions taken, in real life the crime scene will usually get trampled. This is especially true if the original call is a "crime in progress" call, or if the victim is still alive when the first officers arrive. Additionally, people who have a legitimate reason to be on the premises will be moving around, and may turn lights on or off, wash their hands, use the toilet, and pick up objects that should have been saved for evidence. This complicates the picture, and the investigating officer has to work harder to make up for it. At the same time, he and his staff must be careful not to add to the contamination of the scene.

The homicide investigator should travel with a "homicide kit" or evidence kit in the trunk of his car. Among the items should be pairs of rubber gloves, because of the danger of infection from cadavers and spilled blood.

Examining the scene for physical evidence should be in order of the likelihood of damage to the evidence. This is what determines priority. At first, most of the activity will be around the body, which is the main point of interest. The ground or floor around and/or under the body is most likely to be trampled. The search can then proceed outward to areas less likely to suffer damage. A short-cut, to provide a "search path,"

is to reconstruct the sequence of events. Even a rough guess will provide a starting point.

This is contrary to all of the advice regarding systematic searching, as delivered by experts in the field.¹ The customary advice is to search in a geometric pattern, to be sure of spotting everything worth collecting. A geometric pattern is not a good substitute for thought and alertness. Unfortunately, when both time and manpower are limited, it's necessary to take some short-cuts or not accomplish the task at all.

Instead of a geometric pattern, it's better to search in a functional pattern, a search path. Deducing where the killer entered, what he touched, where he stood, what else he did, and how he left gives a much narrower field, and this is the path along which to concentrate the search. Following a search path instead of a search pattern saves time and discloses important clues early, when they can do the most good. This is not to mean that the investigator should search with blinders and ignore the rest of the scene. The main point is to hit the important areas early, when he's still fresh and alert. The less important areas can wait for the next day or for the arrival of a second team, if possible.

Another point is to confer with someone familiar with the homicide scene, to spot anything out of place or not normally there.² This person should be available to answer questions throughout the search for evidence. However, if no such person is available, the investigator must scan the crime scene alertly for anything which appears out of place or which may provide a clue to the perpetrator. Cigarette butts in the ash tray can be helpful, especially if further investigation discloses that the victim did not smoke or smoked a different brand. It's also important to remain alert for possible missing objects. Most people carry keys on their person. If no keys are with the victim, the investigator should find out why not. There are many possibilities, more than will fit on any checklist. The main point is that

the investigator must use his eyes and common sense while searching the crime scene-

Weather can be important if the crime scene is outdoors. An impending or actual storm makes the search urgent.³ While it's possible to protect some evidence by covering it with sheets of plastic or newspaper, often it's a choice between taking short-cuts or not getting the evidence.

Indoors or outdoors, it's best to gather all of the evidence possible, consistent with following the search path order of priority. There may be tire tracks nearby. These are worth "lifting" with a plaster of pans cast. A piece of clothing just might be the suspect's. It's worth bagging and saving until positive identification can clarify its role. "When in doubt, take it out."

It's vital to place evidence in adequate containers and to label it properly, with the date, time, item description, case number, investigator's name, location found, etc. A short-cut is to assign item numbers to each piece of evidence, and to record pertinent details in the investigator's notebook. The label can then simply have the date, item number, and investigator's signature.

SOURCES

1. Practical Homicide Investigation, Vernon J. Geberth, New York, Elsevier Science Publishing Co. Inc., 1983, pp. 131-135.

See also Criminal Investigation: Basic Perspectives, 2nd Edition, Paul B. Weston and Kenneth M. Wells, NJ, Prentice-Hall, Inc. 1974, pp. 48-49. The authors describe and include diagrams of six types of search patterns.

2. Practical Homicide Investigation, p. 146.
3. Ibid, p. 149.

GATHERING PHYSICAL EVIDENCE

PART I: THE BODY

The victim is usually the first priority because it's desirable to get the medico-legal examination underway as soon as possible. The homicide investigator should think of the body as perishable goods, because it is. Certain tests have to take place within a definite time limit, before the biological matter decomposes. This is why it's desirable that the investigator and the medical examiner work together to process the body so that they may clear this part of the crime scene first and obtain whatever information is possible to glean from the condition of the corpse.

The first point is to determine how the victim died. Although in the case of certain poisons, and certain natural causes, the immediate cause of death isn't always obvious, it should be possible to narrow the field. If there are no gunshot or stab wounds the investigator can focus the case more precisely.

The medical examiner should direct this first examination of the body. The investigator should note whatever findings appear, paying special attention to marks of violence and evidence of sexual assault. Some specific items to note are:

Stab or incised wounds. A couple of specific points are their number and their pattern. Many wounds may indicate a frenzied attack, such as a homosexual killing. Multiple wounds do not rule out a suicide, because some suicidal types have great tolerance for pain, or may want to assure that they do the job

properly. "Hesitation marks" are irregularities in the slashes, such as in a cut throat, which indicate that the victim stopped with the first jab of pain and then proceeded. These are almost always indications of suicide.

Bite Marks. If found on the victim, these can match with a suspect's teeth. This is why it's worthwhile to take special care in photographing bite marks. As dimensions are important, the investigator should always include a scale in the photograph. Taking a saliva washing will help in establishing the aggressor's blood type. Distilled water, a cotton swab, and a glass or plastic vial are necessary for this.

Blood. There may be a pool of the victim's blood, but it's wrong to assume that all bloodstains belong to the victim. The attacker may have sustained an injury, too. It's vital to obtain a sample of each bloodstain, noting its location on the container and on the crime scene sketch.

Another point about blood is the shape of the drops. This can indicate if the person who dropped them was still or moving. A round drop stain may or may not have surrounding droplets, and shows a vertical course. An elliptical drop, with a point showing the direction of travel, results if the path of the drop was other than vertical.¹

Waste products, such as urine and feces. These may be the victim's, especially if found inside his clothing. Feces and urine found away from the victim might be the attacker's. Some people lose bladder and bowel control under the stress of fright and combat. It's important to collect a sample of each specimen for later identification.

Vomit found at the scene may be the victim's or the assailant's. Vomiting is sometimes an after-reaction of a stressful experience. If the vomit is the victim's it might be a reaction to poisoning. If so, it will contain some of the poison. Again, it's important to collect a sample of each pool of vomit.

Sputum and saliva are sometimes associated with a sexual act, but in any case will disclose the person's blood type. This is why these are especially worth collecting.

Semen is always associated with a sexual act. Its location suggests the nature of the act. Semen found on the victim, especially around the crotch or mouth, suggest some sort of rape or possibly necrophilia. Semen found away from the victim suggests masturbation before or after the killing. Some people "get off" on killing.

Stains on the skin or clothing can suggest things about the circumstances of death. Mud or dirt on clothing suggests that the victim may have fallen outside, especially if there's a trail leading to the place where he's now laying. Likewise for grease, oil, paint, and other substances not ordinarily on the skin or clothing.

The victim's hands always require special attention because they may offer clues regarding the mode of death or the identity of the assailant. In a suicide by gunshot, there may be powder residue on the hands. Residue can also result from the victim's trying to deflect the muzzle of a firearm. Slashes on the hands are usually "defense wounds," from trying to parry or grab an assailant's edged weapon. The investigator should also examine the victim's fingernails with a magnifying glass, as sometimes the victim scratches his attacker, and tissue typing can nail down his identity. The medical examiner or investigator can take fingernail scrapings at the scene. Placing paper bags over the hands to preserve evidence for the autopsy is the alternative, and this is often the suggestion we find in standard texts on collecting evidence. The problem with this method is that it's essential to examine the inside of each paper bag upon removal, in case any particles of trace evidence fell out of the victim's fingernails or nibbed off slashes in his skin. In the interests of getting the case underway as soon as possible, we have to conclude that taking the evidence right away gets results faster.

Presence or absence of a weapon in the victim's hands is an indication of the circumstances of death, but it's not conclusive. It would be hasty to conclude, upon finding a pistol in the victim's hand, that the death was suicidal. The weapon might have been a defensive one. Only recovering the bullet and matching it to the weapon will point the investigation towards suicide. It's easy to place a pistol in someone's hand after shooting him in the head at contact range. Likewise, it may be that someone took a weapon from the scene before officers arrived. This could obscure the evidence of a suicide. Following up to discover if the victim had a motive for suicide is essential before drawing any conclusion.

Bullet wounds in the body require special attention. It should be possible to determine on the scene whether there are only entrance wounds, or whether any bullets passed entirely through. If exit wounds are evident, there should be a search for the fired bullets, which may have lodged in a wall or piece of furniture nearby, or may have traveled far beyond the scene.

Entrance wounds can provide clues regarding the victim's position when he was shot, if there's a clear indication of the direction from which the bullets came. If the victim's position is clear from other evidence, the wounds can give the direction from which he was shot. It's important to note that exit wounds are not always in a straight line from entrance wounds, and that comparing the two does not necessarily give an accurate idea of the direction of the shot.

DNA FINGERPRINTING

This is a technique for identifying an individual from a small tissue, semen, or blood sample. It's also possible to match a hair root recovered from a crime scene. The key is that one or more body cells must be present. A hair without the root consists only

of dead cells. Saliva is a liquid, and may not have any cells from the mouth lining.

"DNA" stands for Deoxyribonucleic acid, which is the very complex ribbon-like molecule which holds the genetic pattern in each cell. The DNA looks like a spiral helix, with two strands that intertwine and which fit together only one way. The interlocking feature is the result of a specific pattern of chemical subunits called Adenine, Thymine, Guanine, and Cytosine. These are unique to each individual, and this unique pattern makes it possible to link a cell recovered from a crime scene to a specific individual. Only identical twins have similar genes. Cells recovered from the crime scene may be in fingernail scrapings, semen, bloodstains, etc.

DNA fingerprinting is more precise than blood typing, as blood typing only restricts the sample to a particular group, not a particular person. DNA fingerprinting has held up in several American court cases, such as North Carolina #87CRS5081 & 87CRS5080, Florida #87-1695-CF-M, and Pennsylvania #1576-N-1984. The North Carolina and Pennsylvania cases were paternity cases. The Florida case involved murder, robbery, and sexual battery, and the suspect was convicted. There were also two violent crime cases in Britain. One was a rape, and resulted in a conviction. The other involved two cases of rape-murder in Leicester, and DNA fingerprinting exonerated one suspect and convicted another.

Collecting samples for DNA fingerprinting follows the same principles as for other purposes. It's necessary to have the forensic lab perform routine tests, such as blood typing, before sending the sample for DNA analysis.

Blood stains from the crime scene should be 1/4" in diameter or larger. A blood sample from the suspect should be in a 5 ml Lavender top EDTA (K3) evacuated tube.



Semen samples collected in the usual way, with a swab, are suitable. A semen stain on clothing or bedding will also do, if there are sperm cells in it. The stain should be at least 1/3" in diameter.

A minimum of one hair root is necessary for DNA analysis. Because of the varying amounts of DNA contained in hair roots, more than one may be necessary.

Tissue also is suitable for DNA analysis. Amounts required depend upon the type of tissue.

Sample preservation can be important, especially if there is no suspect yet in custody. The reason is that matching requires material from both the suspect and the questioned sample, unlike other tests in which it's possible to "type" or assign a value to the sample and wait for a suspect who fits the category.

The ideal method of preserving a sample is by freezing to 70 degrees below Zero. Room temperature storage will greatly shorten the useful life of the sample, and excessive humidity will degrade it within a couple of days. This is why paper bags work best when storing at room temperature. For freezing, plastic is better.

At the time of writing, late 1988, DNA analysis was being done only by a private laboratory. However, the Federal Bureau of Investigation had announced that it would begin accepting samples on a limited basis within a few months.

SOURCES

- I. Fundamentals of Criminal Investigation, Charles E. O'Hara and Gregory L. O'Hara, Springfield, IL, Charles C. Thomas, Publisher, 1981, p. 517.

GATHERING PHYSICAL EVIDENCE

PART D: OTHER EVIDENCE

Physical evidence will often make the case. We've already seen that an objective study by the National Institute of Justice showed that physical evidence makes a difference in clearance rates. Today, failure to gather such evidence at a major case crime scene is negligence.

It's hard to overstate the value of physical evidence. By comparison with other types of investigative leads and evidence introduced at a trial, physical evidence is fairly objective and free from bias. Witnesses differ in their descriptions of suspects. Informers, especially if they're trying to trade information for a "deal," are bound to be biased, if not outright dishonest. Physical evidence, being impersonal, has no ax to grind. It's mute, and the prosecution must support it with testimony from a person who is both qualified and impartial.

Physical evidence serves several purposes. The most important one is to associate the suspect with the crime. A fingerprint, tissue sample, or weapon can link an individual with a crime scene.

Another purpose is to show an element of the crime. A weapon can indicate how the victim died, for example.

Physical evidence can also help in corroborating testimony and in reconstruction of the crime. This can be very important when there's no eyewitness testimony. Another use is to confirm

or refute testimony or an alibi. This is why it's vital to pay close attention to physical evidence at a crime scene.

Let's continue by laying out a couple of critically important definitions which we need to understand physical evidence. All artifacts found at a crime scene may have two types of characteristics, "class" and "individual." Class characteristics are those found in all objects of that type. All size 12 shoes of a certain brand and style will have similar soles and heels when new, for example. After a certain amount of wear, they develop individual characteristics, gouges, nicks, and wear patterns that identify a particular shoe.

Likewise with tools. All saw blades with 10 teeth per inch and similar tooth profiles are similar. After a certain amount of wear and use, they, too, develop individual characteristics.

We'll see that bullets and fired cartridge cases also have class and individual characteristics. Caliber is a class characteristic. The pattern of rifling marks on the bullet is an individual characteristic.

With biological evidence, we find certain parallels. Blood type is a class characteristic, as millions of people have the same blood type. Genetic type, on the other hand, is definitely an individual characteristic. If the investigating officer understands this basic distinction, he can avoid expecting too much from physical evidence. Let's now look at several types we may expect to find at a crime scene:

BULLETS

If a firearm was involved in the homicide, collecting fired bullets is vital in linking the firearm to the crime. This becomes purely routine work if the killer left the weapon at the scene, but it can be a real challenge if he took it with him, as most do.

Recovering the bullets can provide several important pieces of information. The medical examiner can determine which bullet caused the fatal wound. This can be important if there was more than one person who fired. At times, a wild shot can kill accidentally. If there was a gunfight between an armed robber and more than one defender, it's vital to nail down that a bullet from the felon's gun did the killing, instead of a random shot from one of the defenders.

Finding fired bullets can help establish the position of the weapon at the time of firing, by working back along the trajectory. This task is simpler if there was a miss, with the bullet embedding itself in or passing through a wall. Because the wall is fixed, it's easy to find the bullet path. A bullet recovered from a victim's body cannot provide as precise information because there's no way of knowing the victim's exact position when he was shot. A close estimate is all we can expect. Another problem is, as we've seen, that a bullet can change its course in a victim's body, and leave in a different direction from its original trajectory.

Bullet holes in glass indicate the direction the bullet took. The entrance hole is small, the diameter of the bullet or slightly larger. The exit hole is a crater, and glass fragments will be on the floor beyond it. With plastic materials now being used for windows, the investigator should also know how these materials behave when struck by projectiles.

"Plexiglas," an acrylic plastic often used for shower stalls and patio windows, "crazes" when struck hard. A projectile passing through will leave debris on the opposite side of the impact. One which does not will still leave some "spall," tiny fragments knocked out from the pane, on the opposite side of impact. Polycarbonate plastic, known under the trade names of "LEXAN" and "TUFFAK," does not craze or shatter. It melts under the heat generated by the impact. Polycarbonate often serves as bullet-resistant window material, and as shatterproof

windows or shower doors. A bullet will melt its way through, leaving a bulge on the exit side. A rough guide is that a 1/4" thick panel of polycarbonate will stop a .38 caliber bullet.



The rifling mark pattern is often easy to see with the naked eye if the bullet isn't too deformed. Magnification will show up the small details that can link a bullet to a particular weapon.

Recovered bullets can indicate the type of weapon. If the bullet's intact, it's possible to measure and weigh it, and this information narrows the range of possible weapons. A handgun

or rifle has "rifling grooves" in the barrel, and these leave marks upon the bullet. The direction and pitch of the rifling twist can suggest the make and/or model of weapon. This isn't possible, of course, if the weapon was a shotgun, but it's still possible to make an educated guess from the weight and size of the recovered pellets. If the projectile is a shotgun slug, and it's recovered intact, that pin-points the gauge.

This handgun bullet struck the target with enough velocity to shatter it. When a bullet fragments, pieces go in several directions and may be very hard to recover. Rifling marks can also suffer obliteration.

Rifling marks can also link the bullet to a particular weapon. The important word is "can." There are several problems with rifling marks on bullets. First, if the weapon is brand new, the rifling grooves are freshly-cut or swaged, and will not be very distinctive from one barrel to another. Only as the tool used to cut or swage the grooves wears do the pattern and profile of the

rifling grooves it produces change, and meanwhile there can be many barrels with similar markings.

As the owner continues to fire his weapon over months or years, the barrel wears, according to the number and types of bullets passing through. Dirt and grit in the barrel or on the bullets themselves can also make striations in the weapon's bore, and these can mark bullets subsequently passing through in a distinctive way. With poor care, corrosion also takes its toll of the bore, changing the way it marks bullets passing through.

All bullets don't hold rifling marks equally well. A jacketed bullet fired at moderate velocities is the best sort for this purpose. A soft lead bullet tends to strip its "driving bands" and leave a coating of lead in the barrel. When it strikes, friction against the sides wears off or distorts the rifling marks. "Nyclad" bullets, made by Federal Cartridge Company, have a nylon jacket, which often peels off, making it more difficult to determine the rifling marks. High-velocity pistol and rifle bullets often shuck their jackets or fragment totally, making it difficult to recover an intact bullet jacket or enough pieces to reconstruct one. This adds to the problem of pin-pointing the weapon. Finally, some bullets, such as the "Glaser Safety Slug," are designed to disintegrate totally in the target, and this minimizes the chances of identifying the weapon.

Even bullet fragments can be helpful. It's important to note here that bullets often fragment, more today than years ago. This is because of the trend towards high-velocity ammunition, and the widespread use of expanding bullets. A bullet striking a bone or other solid object can be greatly distorted and can break into fragments.

Recovering the fired bullets offers opportunities for the inept investigator to destroy evidence. It's bad practice to pry a bullet out of a wall or beam with a knife, for example. The blade will leave its own marks on the bullet, and possibly obliterate some of the rifling marks. A better way is to cut out the section of

material in which the bullet is embedded, and to transport it to the laboratory. There, a technician can take his time and chip the surrounding material away without damaging the bullet.

Proper handling of bullets after recovery is vital. Identifying the bullet by scribing the investigator's initials on the base is amateurish. It's not helpful if there's more than one bullet, and if only bullet fragments are on the scene, it's impossible.

It's true that in court the question of how the investigator knows that the item entered in evidence is the one actually found at the scene may arise. While it's nice to be able to answer that the mark on the base of the bullet identifies it, it does not necessarily show the bullet as being in a particular place and can be confusing if there's more than one.

Instead, it's best to place each bullet or fragment in its own plastic tube or envelope, with an adequate label attached. A close-up Polaroid print of each bullet found at the scene will often show enough detail to allow identifying a bullet uniquely. The back of the print provides space for a label describing the bullet, the place it was found, and the investigator's name and badge number.

In handling a bullet, it's important to remember that there may be traces of the victim's blood and tissue on it, and to handle it with care, using tweezers. With the current concern over blood-borne infectious diseases, gloves may be more desirable. In some jurisdictions, they may be mandatory.

FIRED CASES

There may be fired cases at the scene. A fired case is usually an indicator that there was an auto pistol present, as revolvers don't automatically eject their cases. There are some notable exceptions. A meticulous assailant firing an auto pistol may take the time to pick up his empties, to avoid leaving evidence. A

revolver user may have had to reload and no time to pick up his empties. The number and position of cases present helps identify the type of weapon. A cluster of five or six empties suggests a revolver, while cases scattered around the scene suggest an auto pistol.

The type of case found helps identify the type of weapon. Rimmed cases are usually revolver cases. Rimless cases are typical of auto pistols.

RIMMED

RIMLESS

A "rimmed" case has a rim larger than the case body. A "rimless" case doesn't really lack a rim; it just doesn't extend beyond the diameter of the case body. Rimless cases are also slightly tapered, to ease extraction from an auto pistol chamber.

A quick guide to the more common cartridge cases is as follows:

.22 Rimfires, whether Shorts, Longs, or Long Rifles, can be from autos or revolvers. Examining the rim will show whether there's only a firing pin mark or one left by an auto pistol extractor, too.

.25 ACP is usually an auto pistol cartridge. There was, however, at least one make of cheap imported revolver made for the .25 ACP. The case is rimless.

.32 ACP is also an auto pistol cartridge. The case is rimless.

.380 ACP, ditto. Note that the .380 ACP is a short version of the 9mm Luger.

9mm Luger. This is now the U.S. Military handgun cartridge, and is standard with many police departments, too. It's very adaptable to high-capacity, double-column magazine auto pistols. Some of these offer as many as 18 rounds without reloading. This will be an increasingly popular choice for police and lawbreakers alike. The case is also rimless. A few revolvers are chambered for this cartridge.



The base of this fired 9mm case has minute marks that can link it to the weapon which fired it. The firing pin strike is distinctive, and a slight notch on the case rim may have come from the weapons breech face.

.38 Super Auto is a "semi-rimmed" case for auto pistols. "Semi-rimmed" means that the rim is somewhat smaller than that of a rimmed case, yet not flush with the case body as with a rimless case.

.38 Special is a revolver cartridge. Only one American made auto pistol is made for the .38 Special, the Smith & Wesson Model 52, which is a very expensive target pistol, not suitable for a killing. The .38 Special has a rimmed case.

.357 Magnum is almost always a revolver cartridge. There are a couple of limited production auto pistols for the .357, the Desert Eagle and the Coonan, but these are specialty weapons, unlikely to be involved in crimes because affluent gun hobbyists usually don't commit stick-ups and murders. This also has a rimmed case.

.41 Magnum is also a revolver cartridge. This is not likely to be a criminal weapon, because revolvers made for it are large and not very concealable. Recoil is too heavy for most people, although there are some light loads available. This cartridge has a rimmed case.

.44 Magnum. The same comments apply, with one exception. There are some "combat" models of the .44 Magnum revolvers on the market, and some criminals may use them because of the popularity of the "Dirty Harry" mystique. This cartridge also has a rimmed case.

.44 Special is a shorter cartridge, the forerunner of the .44 Magnum. There are several small five-shot revolvers made for this cartridge, such as the Charter Arms Bulldog, and these are very concealable. This rimmed cartridge will also fit .44 Magnum revolvers, and some shooters use it as a light load for the big magnum weapon.

.45 ACP is the previous U. S. military cartridge, and is usually fired from an auto pistol. A few revolvers, such as the Smith &

Wesson Model 25-5, are chambered for this cartridge. The case is rimless.

This list is not exhaustive or comprehensive, but only a quick sketch of the calibers most likely to turn up at the scene. There are many exceptions to the cases listed, and many oddball events. There have been murders and robberies with rifles. All of the calibers listed can also be fired in single-shot pistols, although these are very rarely used in crimes. There are adapters which allow firing of various handgun cartridges in shotguns.

If the cases are from auto pistols, their position can provide a clue to the position of the weapon when fired. An extractor mark on the rim signifies an auto pistol, if there's any doubt. Most autos eject their cases to the right. One exception is the Walther P-38, which throws its cases left.

Finding the position of the weapon when it was fired is often partly guess-work. Cases can bounce off walls and furniture, and when they come to rest on the floor people kick them. Because of their cylindrical shape, they tend to roll. In some instances, fired cases end up many yards from the shooting. Such was the case in the FBI shooting in Miami, on April 11, 1986. With four dead and five wounded, paramedics and others trampled the scene, and some of the cases wound up far down the street.

As with bullets, it's important to handle fired cases carefully. One point some overlook is that the shooter had to handle the cartridges to load them into the weapon or the magazine. There may, therefore, be fingerprints or "partials" on the cases. A fingerprinting examination should always come first, before packing the cases away and risking damage to latent prints.

Contrary to the advice given by some authorities, it's important not to place any marks on the case. Marking the case inside the case mouth, as some advise, is both poor practice and unnecessary.¹ A better way is to place each fired case in a plastic envelope and label it. The procedure is much like handling fired bullets.

WEAPONS

The first step in processing any weapon for evidence is to work it for latent prints, although the chances of developing a print from a firearm are poor. The value of a print, if one turns up, is so great that it would be unwise to overlook the opportunity. A knife or other metallic weapon offers somewhat better chances of finding a useful latent print.

A firearm is not going to discharge accidentally from being tickled with a fingerprint brush. This is an important point, because some people make a fetish out of firearms safety. It's a serious error to hasten to render a weapon "safe" before beginning the examination. This is a point to communicate to patrol officers, because they're usually first on the scene. A patrol officer who acts as if he thinks a loaded weapon will jump up and shoot someone will be tempted to unload it, and this can destroy several points of evidence, as we've seen.

Picking up the weapon before examining it for prints is poor practice. Inserting a pencil into the barrel can destroy evidence if the firearm was used in a contact shooting, because tissue and blood may have been blown back into the barrel. Unloading the weapon can also destroy evidence. Simply opening a revolver's cylinder makes it impossible to determine which cartridge case was under the hammer. This can be crucial when there's a question regarding the sequence of shots.

Fingerprinting a firearm starts with the top surface. Once that's finished, it's possible to turn the weapon over by levering it with a pen or pencil under the grip plate. Most pistol grips are checkered, and don't hold fingerprints. Gripping the weapon by the edges of the trigger guard will also avoid destroying fingerprints. If the firearm is a shoulder weapon, it's possible to use the sling or sling swivel to turn it. After working the weapon's exterior, it's advisable to unload it. With a revolver,

it's important to mark which chamber was under the hammer at the time. The investigator can do this with a marking pen, placing a mark down the side of the cylinder on both sides of the top strap. Cases and cartridges also may have latent prints, and it's worth processing them before bagging them. It's also essential to place each cartridge or fired case in an envelope marked with its position in the cylinder. For this purpose, the chamber under the hammer is chamber number one, and the rest are numbered clockwise from the rear.

It's not necessary to mark the weapon before packing it as evidence. Noting the make, model, serial number, and individual peculiarities in the notebook is enough. Sealing the package and labeling it correctly will assure correct identification.

CLUES FOR IDENTIFICATION

The scene may contain clues regarding the identities of victim or attacker. In many cases, for example, the victim will have a wallet on his person. At times, the attacker loses his wallet. More often, though, clues to the attacker's identity will be more subtle and less definite. Fingerprints, for example, are not always clearly visible. It's important to screen the area for fingerprints, which are fragile and easily obliterated, before handling objects and examining them more closely.

If there's been a struggle, the attacker may have dropped or lost an item of personal property which can lead to him. House or car keys don't automatically point to the attacker, but if there's a suspect list it's practical to physically try the keys to determine where they fit. This is why there should be an effort to check out each piece of personal property to determine if it belongs to the victim, or possibly someone else.

Another class of clues are those that point towards a possible suspect list. If there's an appointment book on the scene, its

pages may disclose who saw the victim last. Interviewing those whom the victim met the day of his death and the day before may bring out additional details, such as evidence of worry over threats, etc. An address book or roller card file can bring out a list of possible suspects. It's important to scrutinize these carefully for evidence of a card removed, just as it's important to watch for an address book with pages missing. This may provide the first letter of the killer's surname.

Personal and business papers may provide a clue regarding motive, which can point to a suspect. Bank statements showing large withdrawals may suggest blackmail, for example. Large deposits of unknown origin suggest an underground income. If this has to do with drugs, for example, it can suggest a motive.

Certain types of bills can help reconstruct the victim's last few weeks or days. Telephone bills provide a list of toll numbers called. Credit card statements may list hotel, airline, and rental car charges. Likewise, a checkbook can provide similar information, and more. Alimony and child-support payments are worth noting. Unusually large deposits can point the way to financial irregularities.

FINGERPRINTS

Fingerprints in a crime scene are not as common as many suppose, which makes their careful collection vital to the investigation.

When access to the crime scene is normally limited, and there are latent fingerprints recovered, the first step is to collect "exemplars" from everyone who had access. This provides a basis for eliminating, and centering upon fingerprints "foreign" to the scene. A simple and portable fingerprint pad allows taking exemplars from subjects on the scene, if necessary, and recording their prints on white cards. For exemplars, it's only necessary to

press each finger onto the ink pad and then onto a card, being careful to maintain the same order as on the hand. The most important point to watch about inked fingerprints is that they be clear, with clearly defined ridges, not dark smudges.

This exemplar fingerprint, taken with an ink pad and card, serves for comparison with latent prints developed at a crime scene.

It's even more helpful to obtain a full set of rolled prints. This allows checking each person for "priors." It also helps identify partial prints, sometimes made with the side of the finger.

DEVELOPING LATENT FINGERPRINTS



A small fingerprint kit serves for bringing out latent prints. Some difficult subjects require special development, not possible with the limited supplies in a pocket kit.

A fingerprint left on a surface is called a "latent" fingerprint because it's not clearly visible until developed by the fingerprint technician or police officer. The latent print has impressions of the ridges in the skin of the fingertip, formed by oils and sweat secreted by the skin.

Some fingerprints, such as those formed in blood or other substance which is clearly visible, are not latent. It's only necessary to photograph them for evidence.

Latent prints are fragile, and developing them has traditionally been a task for the expert. The large agency can send one out to the scene when necessary. The small agency usually hasn't got

a latent fingerprint technician, and the task falls upon someone else.

In a homicide, this is the investigator, or someone on his team, equipped with a small latent print kit. One such kit, made by Sirchie Fingerprint Laboratories, consists of a couple of vials of fingerprint powder, a couple of brushes, and some other accessories. Also included are some "lifts," patches of tape used to remove the developed print from the surface and transfer it to a card. A magnifying glass, some evidence labels, a portable ink pad, and some fingerprint ink cleaning towelettes are also included.

The most important point is to develop the prints on the spot, or use super glue vapor to fix them, to avoid damage if it becomes necessary to transport evidence to the crime lab. The simplest way to develop latent prints is by "dusting," using a fine-grained powder that adheres to the fingerprint and makes it visible. The officer selects a fingerprint powder in a color or tone contrasting with the surface on which the print is.

The sequence to follow is to work on the areas and surfaces most likely to be damaged first. These are the door handles, light switches, windows, and telephones. If a motor vehicle's involved, working the area around the driver's seat is most likely to provide results.

There are two types of fingerprint powder, magnetic and non-magnetic. Magnetic powder contains finely powdered iron, as well as powdered graphite, and can work with a brush, but a specially-made magnetic wand is better because it's designed for this powder. The magnetic powder wand contains a magnet that picks up the powder, which forms fine filaments following the magnetic flux lines. The investigator developing a print with magnetic powder should pass the wand lightly over the surface, with only the tips of the powder filaments touching the surface. Powder from the filament tips will stick to the fingerprint ridges.

Magnetic powders seem to work best on porous surfaces, but there are exceptions.

There are two types of non-magnetic powders; "slip" and "stick." The stick powder is a metallic powder, and the slip powder is an oxide type. The desirable powder will stick to the moisture in the fingerprint ridges, not the surface.

There are practical tricks of the trade in developing latent prints. Searching for "latents" can be time-consuming, but one trick which helps show up any latents is to shine a flashlight on the surface at a very oblique angle. In many crime scenes, fingerprints won't be perfect. They may be only partial prints, or they may be smudged. This is especially true of certain surfaces, such as those on doorknobs and weapons. The fingers tend to slip when clasping these, and rarely leave very good latent prints. In a major case, it's worth looking for palm prints as well, and trying to match them with exemplars.

Selecting the powder to use is another decision the investigator must make. One way to eliminate guess-work is to test the surface with the officer's prints. This allows a test with the powder first, and shows whether it will work or not. Trying another print and another powder will show if it's possible to improve results.

Fingerprints dry out by evaporation. Exhaling gently on the surface before applying the powder will restore the moisture. Applying powder too soon after this will make it stick to the entire surface. It's best to wait about ten seconds.

A practical way to handle the powder used to develop fingerprints is to pour some out onto a sheet of paper, and pick it up with the brush. This is essential when using a portable fingerprint kit with small vials. It also minimizes the danger of spilling powder by overturning a larger jar.²

Using short brush strokes in the direction of the ridges will bring up the print with the least damage to the ridges. A light

touch is important, to avoid a smudge of powder. Smudging comes from applying too much powder, or applying it too heavily. Unless the latent print is smudged, every ridge should be visible.

The investigator may have heard that magnetic powders don't work on metallic surfaces, and may have concluded that they won't develop prints on anything made of metal. This isn't necessarily true, and the investigator should run a test on the particular painted surface before giving up. The paint acts as an insulator, and it's often possible to develop excellent prints on painted metal.

It's even possible to develop latent prints on paper, if the prints are not too old. The way to do this is to spill powder onto the area of the paper with the latent print, then pour it off. Blowing any remaining excess away completes the job. This works, strangely enough, with both magnetic and non-magnetic powders.

Once a print is developed and clearly visible, the best method of preserving it is to photograph it, because other techniques involve touching the print and risk damage. Using a tape "lift" can result in air bubbles and "fish eyes" caused by grit. Another point is that it's difficult to lift a print from a curved or irregular surface.

Photographing the print requires a 35mm SLR camera, tripod, and extension rings to allow close focusing on the print. There should always be a scale within the camera's field of view to allow making an exact 1:1 reproduction with an enlarger. Illumination should be by ambient light, as flash can cause glare with some surfaces. A cable release helps avoid jarring the camera.

There are specially-made fingerprint cameras. These have their own light source built-in, and a frame or bracket to assure correct focus. These are good for photographing fingerprints, but they're not useful for other photography. Another problem can

arise because of their limited field of view and fixed focus if there are many prints or a palm print present on the surface. It then becomes necessary to overlap frames to record the entire area. A 35mm camera allows backing off enough to include the whole area of interest. The large film capacity allows many exposures, which are often necessary.

"Bracketing" exposures is a good way to ensure getting optimum quality photos. This means making several exposures at different levels. One exposure at the indicated level is a start, and opening up the aperture by one and then two stops allows for inadvertent under-exposure. Likewise, giving another exposure one stop under, and another at two stops less than the indicated one, covers the ground in the other direction.

Without a camera, it's necessary to "lift" the print. One way is to lift it off by using a wide piece of clear cellophane or mylar tape. Transferring the print to a card that contrasts with the powder makes a clear record. A white card works best with black or gray powder. With white powder, a black card is better.

A ready-made product is a "hinge lifter." This is a rectangle of clear acetate tape attached to a backing surface. Lifters come with different shades of backing surface. Once the print is lifted off the surface, it sandwiches with the backing.

Rubber lifters are for irregular surfaces. With these, the print comes out flopped, that is, backward. Both rubber lifters and the hinged type are more expensive than tape. A roll of 1 1/2" wide tape is available at almost any stationery store, and is adequate for most jobs.

Lifting won't work with some surfaces. Trying to lift a print from paper, cardboard, and some painted or whitewashed surfaces will destroy both the print and the surface. In such cases, photographing the print is essential. The investigator can preserve the print by placing tape over it and transporting the object to the laboratory. In some cases, it's necessary to cut out

and remove a section of a wall or door to preserve the original print.

Pre-printed latent fingerprint cards are useful items, but not essential. Their advantages are that they look neater and more professional, and that it's possible to order them printed OD different colors of paper stock. The reverse side, which is for the latent lift, can be white, black, or gray, and should be a coated finish.

TYPE OF CRIME	
ADDRESS OR LOCATION	DATE * TIME
OFFICER	BADGE*
LOCATION OF PRINT:	
UK Rev™ Side For Lift.	

Latent fingerprint card

The officer lifting the prints should draw a diagram of exactly where he found the print on each card in the space provided.

Previously, it was mandatory to develop latent prints on the scene, because they're vulnerable to damage and often don't survive travel. A new cyanoacrylate product has changed the situation. One is a "super glue" in a disposable pad, which the user strips open and leaves inside the vehicle for perhaps twenty minutes, depending on the temperature and the size of the room. The super glue fumes fix the latent fingerprint by combining with the fat and salty deposits that make up the delicate fingerprint ridges. This hardens the ridges, making them much more resistant to damage than the untreated print. Super glue is also available in a spray can for small areas.

There are other ways of developing fingerprints but they're too involved for use on the scene by anyone who's not a specialist. Some chemicals used for this purpose, such as ninhydrin and iodine, are toxic and require special care in their use. Some require fuming cabinets and heating the surface gently for hours or days.

It's still worthwhile to seek out fingerprints when searching a crime scene. The task of matching prints is not too laborious, and can produce good results.

Matching the prints may be fairly easy, or extremely difficult. The problem always has been the time required to compare evidentiary prints with those of a list of possible suspects. If there is a short list of suspects, and it's possible to obtain exemplars from them, examination can take very little time.

If there are no suspects for the particular case, another step is to try to match the prints with those on file of people with records of that type of crime. Depending on the jurisdiction, this can be a small or formidable task. If this proves fruitless, the next step is the general file. Finally, there can be a request to state or federal agencies, which will probably not produce results simply because it's a back-breaking task to examine millions of fingerprint cards. This takes place very rarely, only in the most important cases. Manual examination of fingerprint records is very slow, and few agencies have the resources to carry out a manual search except for very short suspect lists.

The introduction of Automated Fingerprint Identification Systems (AFIS) makes a computerized check of fingerprints on record possible. This technique is still in its infancy, and few agencies have it, but it's the wave of the future. The trend today is for the larger agencies to obtain the first generation systems. Agencies with regional responsibilities, such as state and county police forces, are also getting into computerized fingerprint records as quickly as they can.

This is what makes it worthwhile to go over each crime scene for fingerprints. Recovering a single print may not solve the immediate case, but can lead to dropping several charges onto a suspect if, after apprehension, a computerized single-print check links him to several killings. This is why a fingerprint check should be global, not limited to a special category of suspects. A single print found on the scene may match one left in a kidnaping, or match a print in the general files. This can be helpful in clearing dead-end cases.

There is no statute of limitations on murder, and even if a single print recovered from a dead-end case lingers in the file for years, there will be an increasing chance of making a "hit" with a computerized system. Although there may be no such system installed at the time of the homicide, once such a system goes on-line, it will pay to go over old cases. A previously unidentified print may get a hit several years down the road. One possible reason is that the killer may go on to other crimes, and get arrested. This places his fingerprints into the files, and makes them available for a match.

EXPLOITING FINGERPRINTS

Once all possible latents are developed and catalogued, the investigative work begins. The two important questions to ask, after collecting all possible latent prints, are:

"Who had a right or a reason to be there?"

"Whose fingerprints were actually found there?"

These two questions obviously apply only when the crime scene is a home, car, or certain types of business. With limited access to the crime scene, it's simple to infer that anyone not on the authorized list had a sinister purpose if his prints turn up on the scene.

If the crime scene is a subway car, public library, or supermarket aisle, the investigation has to take another track.

Anyone might have had access, and the immediate task is to separate those who had, and admitted, legitimate access from those who claim they were not there. When interrogating suspects, the investigator can often take advantage of their guilty knowledge, but without revealing that their fingerprints were on the scene. An elementary question to ask is whether the suspect had been on the scene at a certain time, and to follow this up by asking if he had been there at any other time. A suspect who denies having been where his latent fingerprints definitely place him is obviously lying, and the physical evidence then becomes useful as a lever in the interrogation. Even if the suspect refuses to answer further questions, getting his denial on record and refuting it with fingerprint evidence can convince a jury if the case goes to trial.

Contrary to what many believe, it is possible to falsify latent fingerprint "lifts." This is why a commanding officer must be watchful. An overly enthusiastic criminal investigator, or one being pushed hard for a break in a case, may be tempted.

One method of falsifying latent prints is by making a xerographic copy of an exemplar, but disconnecting the heater in the copy machine. This produces an "unfused" image, a layer of powder in the image of the fingerprint on the paper, and this can be taken off with a lift.

OTHER PHYSICAL EVIDENCE

Let's pass quickly over other types of physical evidence that can help clarify the crime picture. Some types of evidence are easier to collect and interpret than others. In many cases, the investigator will be able to do his own evidence collection. With other types, he'll need a specialist.

Biological evidence, as we've seen, is perishable. Most other physical evidence is not. Fingerprints are delicate, but a bullet embedded in a wall can wait for the arrival of a specialist.

Tool marks may indicate a breaking and entering. A crowbar or other pry tool leaves an impression on a door or window frame. Some methods of lock-picking leave characteristic scratches around the lock. Before leaving the indoor crime scene, there should always be a quick check of all doors and windows, just in case.

It's important to note that the presence of tool marks indicating an illegal entry doesn't necessarily connect with the homicide. They may have come from a previous crime. Judging their age requires inspecting them for corrosion or rusting, if made in metal, and interviewing people who might have knowledge of previous burglaries at the crime scene. Checking with Central Records won't necessarily disclose this sort of information because about 50% of burglaries are not reported to the police.³

Hair and fiber examinations can sometimes help link an individual to a crime scene. However, this type of evidence isn't conclusive. Microscopic examination can point to an individual, but not with absolute certainty. This is especially true with clothing fibers, because clothing is mass-produced, and many different individuals in each jurisdiction will have the same type and color apparel. A more definite result is ruling out a possible suspect. Blond hairs cannot come from a person with brown hair, for example.⁴

Footprints may be in blood, oil, dirt, and other substances. At times, it's possible to obtain an impression of the sex, height, and weight of the person who made the footprints. There are many exceptions that confuse the picture, and any conclusions regarding the person's height or weight are tentative.⁵

When the footprint is impressed into dirt or clay, it's possible to make a casting for later comparison. This is also true of tire prints.

If a vehicle was involved in the crime, tire prints can help identify the vehicle, or at least narrow the type of vehicle in question. Measuring the track allows estimating the type of vehicle. The tread pattern also allows a good guess. Motorcycle tires have a definitely different tread pattern than those made for automobiles, as they have tread running up the sidewalls. This is worth keeping in mind if only one section of tread print is available.

Pinning down a particular car by one tire print is chancy. Many different brands of tires are made by only a few factories, which confuses the picture greatly.⁶

Making casts of foot and tire prints is simple in principle, but the details are intricate. The classic method is using plaster of pans, pouring it into the impression and allowing it to set. The ideal consistency for mixing the plaster is that of pancake batter. With a slightly runny mixture, there's a better chance of picking up fine detail.

Plaster is not the only casting medium, nor is it always the best. One authority suggests that dental stone, available from dental supply houses, is better and lighter.⁷ For tool marks and impressions in metal, silicon rubber works very well.

A cardboard box will protect the print until the investigator is ready to make the cast. He should also photograph it, without fail, before doing anything else. This serves as insurance against mistakes. It's also a hedge against the prospect of weather damage in the case of outdoor prints. Rain and sleet can quickly destroy impressions.

A major step before pouring the casting is preparing the surface. If the print is in dirt, spraying with hair spray will help firm up the surface and prevent damage from pouring the

material. In dry and dusty dirt, it's a good idea to begin with a light water spray delivered with an atomizer. In spraying anything onto the surface, it's vital not to blow away part of the print, which can happen by holding the spray nozzle too close to the surface. Spraying from several feet up, and letting the spray drift down onto the print, is one way to avoid this. Spraying onto a piece of cardboard above the print, and letting the spray deflect down onto it, is another.

If the print is in very damp soil or mud, or if there's water inside the print, sprinkling the powder directly onto the surface will help preserve it. A light coat of plaster powder will absorb water and set right in the cavity, preparing the way for the main casting to follow. This method also works for prints in snow, but requires more care.

Snow presents special problems. Snow is soft and impressions are easy to damage. If the air temperature increases, the snow can melt. When starting the cast, it's important to remember that plaster of paris gives off heat as it sets. This is another reason for starting out with only a light sprinkling of plaster powder, to form a shell into which other plaster can go after the shell sets. In fact, it's best to make several applications, with fifteen minutes' interval between each one. A flour sifter is a good tool to use for spreading the plaster powder in a fine layer.

Whatever the medium in which the impression is, it helps to reinforce the casting by pouring it in several layers and placing reinforcing material on top of each layer. Twigs are not very good for this, as they can swell and crack the casting. A better material is wire mesh. Another is glass fiber sprinkled onto the surface.

In building up the thickness of the casting, it's sometimes desirable to form a retaining wall around the impression. Pieces of wood, cardboard, or a small dirt bank, will work for this.

With a plaster or dental stone cast, it's both permissible and worthwhile to mark the back of the casting for identification

before it dries. The investigator's name, badge number, the case number, and the location are the minimum required.

CLUES REGARDING THE TYPE OF HOMICIDE

There are two classes of clues which can indicate the type of crime: those having to do with the attacker and his behavior, and those relating to the victim and his lifestyle.

Certain types of physical clues suggest the type of crime. A missing wallet suggests robbery. Open drawers, disturbed furniture, and missing valuables suggest either robbery or an interrupted burglary.

The condition of the victim's clothing may suggest the motive. A victim who is clothed but with the genital area exposed often indicates a sex crime, especially if there's semen found on the victim or at the scene. A corpse found nude in bed may be the victim of a sex crime, especially if there are sex accessories nearby. These may be pornography, sex toys such as vibrators and various leather straps and apparel, lubricants, soiled paper or cloth towels, condoms, etc.

The investigator should be able to recognize sex toys when he sees them. A good way to obtain a quick education in sex toys is to make a quick visit to an "adult" store and observe the devices for sale. These are usually packaged on plastic blister cards, with labels and illustrations of their use.

Dressing in clothing of the opposite sex also indicates a sexual aspect to the crime. When combined with hanging, this suggests the possibility of a masturbation death.

A belt, rope, or other ligature around the neck points the way to a sex crime if the victim's genital or anal areas are exposed. A likely possibility is that the assailant had spent time in prison,

because one technique used in prison sodomy is to control the victim with a rope or belt around the neck.

Satanic murders are very rare, but when one occurs, the killer leaves evidence of a ritualistic killing. Some traces of a satanic murder are: occult signs and symbols, such as a pentagram and the number "666" drawn on the floor or walls. Candles and incense can also signify ritualistic murder. Mutilation of the body is another clue, but this can be ambiguous. Mutilation or amputation of the genitals may be sexual or satanic. Removal of the heart suggests satanism. Amputation of the head and hands is another matter. This is probably simply an attempt to prevent identification of the body, unless the body is found at home or in a place where people can identify it.

The victim often has possessions which disclose aspects of his lifestyle which may not be generally known among friends and neighbors. A syringe, needle, a small quantity of drugs, and "tracks" on his body where veins are close to the skin suggest injected drug use. Larger quantities of drugs, the absence of tracks, and possibly a large amount of cash suggest a dealer. If no cash is present, the motive may have been robbery during a "drug bum."

Pornography sometimes suggests a motive. Photographs of children in sexual situations forces the investigator to consider angry parents as possible suspects. If the children can be identified, this leads immediately to a list of suspects.

Several sets of personal I.D. indicate the need for a close investigation into the victim's background. A thorough check may disclose a criminal record.

An important point for investigators to watch is that the indicators of lifestyle and the possible motive should fit in with the victim's lifestyle as apparent from other sources. This is because some killers try to disguise the motive to throw investigators off the track. A simple form is to remove the victim's wallet to make the crime look like a robbery.

EVIDENCE CUSTODY AND TRANSPORTATION

Preserving the "chain of custody" is vital for a successful prosecution. This means documenting possession of every piece of evidence at every step. Each police agency has its procedure for this.

Keeping an assortment of self-adhesive labels in the evidence kits is important, because these will adhere to both plastic and paper bags, as well as various sorts of evidence vials and solid containers. It's possible to have such labels printed with spaces for case number, officer's name, and other information relevant to the crime.

Hand-carrying is the best way of transporting evidence. This is routine when sending evidence to the department's property room, but it may be inconvenient when shipping certain samples to a forensic laboratory for analysis. In such a case, an air express carrier works well, because each shipment is documented.

Certain biological samples require dry ice in the packaging. Others, such as urine, do not. The general rule is that anything containing cells must be refrigerated or frozen.

There should be adequate labeling on the package, and on the inner container with the sample. A letter of transmittal, containing all pertinent information, should accompany all evidence shipped or hand-carried. This documents the agency, case number, and investigating officer, and provides a summary of the case and how the evidence fits into the picture.

SETTING PRIORITIES

Physical evidence increases the chances of a successful case clearing and prosecution.⁸ This is why careful collection and after-care are essential.

In many areas, forensic laboratories do not examine all of the evidence submitted. A bloodstain, for example, can't provide much information without a sample for comparison. Simply knowing the blood type and Rh factor doesn't narrow the possible suspect list enough to make it worthwhile in many cases. DNA Fingerprinting, as we've seen, works only with a sample for comparison.

Other factors that affect the decision to examine evidence, and the order of priority, are the importance of the case, the perishability of the evidence, and various emergencies determined by the circumstances of the case. These can include the need to identify or clear a suspect because of a time limit for holding him in custody, evidence in a case slated for a hearing or trial, and special requests by the prosecutor or court.⁹

CONCLUSION

Physical evidence, as we've seen, can make or break a case. This is why it's worth preserving. Although the U. S. Supreme Court's "Arizona vs. Youngblood" decision, of November 28, 1988, stated that a conviction could not be overturned simply because police had failed to preserve evidence that might have pointed to the defendant's innocence, an investigator should still take care to preserve evidence to the best of his ability. Anything less not only risks convicting the wrong person, but allowing the guilty one to escape.

SOURCES

1. Fundamentals of Criminal Investigation, Charles E. O'Hara and Gregory L. O'Hara, Springfield, IL, Charles C. Thomas, Publisher, 1981, p. 82.

2. A Practical Guide to the Basics of Physical Evidence, Claude W. Cook, Springfield, IL, Charles C. Thomas, Publisher, 1984, p. 15.
3. Criminal Victimization in the United States, 1983, U. S. Department of Justice, Bureau of Justice Statistics, 1985, p. 85.
4. A Practical Guide to the Basics of Physical Evidence, pp. 26-27.
5. Ibid, pp. 101-106.
6. Ibid, pp. 115-117.
7. Ibid., pp. 126-127. One brand the author suggests is "CASTONE."
8. Forensic Evidence and the Police, The Effects of Scientific Evidence on Criminal Investigations. National Institute of Justice Research Report, 1984, pp. 69-70.
9. Ibid, pp. 74-78.

PSYCHOLOGICAL ASPECTS OF HOMICIDE

Psychology and psychiatry are definitely relevant to many murder investigations because of the number of "kooks" who commit murders. There are also certain aspects of a homicide investigation which involve psychology, if only tangentially. We'll see that polygraph tests, psychological profiling, and the use of "psychics," all touch upon psychology.

Let's begin with a warning. Psychology and psychiatry deal with intangibles. Human personality factors and pathology are not objects which we can touch and measure in ordinary ways. They're real, but very hard to define and measure, and there's a lot of room for interpretation and honest differences of opinion. Because of this, there's also a lot of room for charlatanism. Unfortunately, many aspects of modern psychology and psychiatry have been charlatanism. There's no shortage of practitioners, each with his own theory which he can explain but never prove. It's also easy to find an "expert" to contradict a theory which proves troublesome. Any trial which involves an insanity defense has its quota of experts, as we all know.

As discussed earlier, a police investigator cannot testify in court as an expert witness regarding the "sanity" of a suspect. However, he can gather and document his facts regarding the suspect's behavior, and thereby help his case if the suspect behaved in a logical and rational manner.

A working knowledge of criminal psychology is worth having, as long as the investigator takes it with a grain of salt and understands that many psychological theories have no scientific proof and, indeed, become obsolete when a new theory comes along. Knowing the jargon can help when dealing with psychiatrists and psychologists, as well as providing a background for understanding certain techniques such as psychological profiling.

SERIAL KILLERS

There's a sharp difference between multiple killers and serial killers. Multiple murderers kill several people during the same occasion, as happened in the Clutter Murders in Kansas in 1959.¹ Serial killers kill individual victims over a period of time.

The consensus seems to be that serial killers are either a new phenomenon or are more common today. Actually, there's no basis for this conclusion. Serial killers are not new. They've been with us for all of recorded history. A Medieval French serial killer who sexually murdered young boys was Giles Des Rais. More recently, the notorious "Bluebeard" was another French serial killer. At about the same time, Dr. Bougrat in Marseille was killing young ladies to satisfy his tastes. In Britain, "Jack the Ripper" killed at least five women a century ago. The Christie case was another British example. John Christie killed at least eight women between 1942 and 1951.²

In this country, we've had our share. The "Zodiac" Killer was a serial killer, as was "Son of Sam." However, "Zodiac" was never caught. Dean Corrl and John Wayne Gacy were two recent homosexual killers of teen-age boys. Juan Corona, in California, held the record for serial killing until recently, when Henry Lee Lucas claimed to have outdone him.

Lucas is another serial killer who has led the police on a complicated investigation. For awhile, he was confessing to murders right and left, and spending days at a time traveling around the country, in police custody, to be interviewed by officers in various jurisdictions where he claimed to have committed his murders. However, doubts soon began to accumulate, and officers began to question Lucas* truthfulness. Lucas has since retracted most of his confessions, and investigators are now wondering if he took them for a ride.

We don't truly know whether the recent prominence of serial killers is the result of an increase in their number or simply an increased awareness of their existence, coupled with improved investigative methods. A practical point is that, years ago, this country was far less crowded. It was easier to dispose of a corpse in a remote place without fear that it would be discovered. There may have been serial killers who remained unsuspected throughout their careers.

PSYCHIATRIC APPRAISALS

Whatever the issue, the moment psychiatrists and psychologists become involved the chances for a totally off-the-wall conclusion to the case jump dramatically. The case of John Hinckley, convicted of shooting President Reagan and three others, showed that we can collect a panel of psychiatrists to testify in our favor. It's equally easy to find another panel to contradict them.

In the "Hillside Strangler" case, the result of a psychiatric examination was catastrophic. The person accused of being the Hillside Strangler, Kenneth Bianchi, raped and strangled ten young women in California in five months during 1977 and 1978. About a year later there were two young ladies strangled in Bellingham, Washington. The person arrested for these

killings was Bianchi, whose fingerprints matched one found during the Los Angeles investigation.

Bianchi showed signs of having memory lapses and a strange personality, and authorities asked a psychologist, Dr. John Watkins, to hypnotize him and elicit more information. Under hypnosis, Bianchi stated that he had more than one personality inhabiting his body. This seemed to show that an insanity defense would work. However, the prosecution had him examined by a psychiatrist, Martin Orne, M.D., Ph. D., and he concluded that Bianchi had been faking. Part of the reason for this conclusion was that investigators discovered that Bianchi had previously posed as a psychologist, and had acquired some knowledge of psychology. His demonstrated tendency to "con" people was evident, and the conclusion of faking was well-supported by the facts.³ It's also obvious that someone accused of a crime which carries the death penalty has excellent reason to fake people out.

Failure to recognize this elementary fact has led to many erroneous opinions by psychiatrists. This is especially true when examining street-smart repeat offenders who have spent time in prison and gotten a post-graduate course in crime. Academics with strings of initials after their names tend to be self-satisfied, and some even see themselves as a superior breed. Doctors and psychologists, especially, tend to feel that they have special insights into human behavior, and this makes them complacent and easy to fool by a street-smart criminal who knows how to play the game.

PSYCHOLOGICAL AUTOPSY

This term refers to reconstruction of the deceased's personality by a psychologist or psychiatrist. The purpose is to provide an appraisal of whether or not a certain behavior pattern was appropriate or likely. A questionable suicide, for example, might

be a suitable subject for a psychological autopsy, to provide a clue as to whether or not the victim is likely to have committed the act. Negative results might suggest a murder dressed up to resemble a suicide.

The problem with a psychological autopsy is that it results in a diagnosis by someone who has never examined the patient. This is like a physical autopsy by a forensic pathologist who never sees the body. Apart from questions regarding the psychologist's or psychiatrist's competence, the procedure itself is very uncertain.

Often, equally valid results are obtainable by questioning the victim's relatives, close friends, and associates. These can often provide information regarding the victim's recent mental state, based on his behavior. A victim who had recently suffered severe personal losses and who spoke of suicide, for example, is an obvious candidate for self-destruction.

PSYCHOLOGICAL PROFILING

This technique has been long in developing, and is still haphazard. Psychological profiling has an antecedent in the "modus operandi" files that police agencies keep to correlate crime patterns and techniques. The M.O. can point a finger at a particular offender, or a group of offenders who follow a certain pattern. In this sense, using the M.O. file can save time by narrowing the search at the outset. In one sense, we can call the M.O. file a "behavioral profile."

The psychological profile is an outgrowth of this. There have been efforts to apply psychological profiling to both civilian and military ends. One of the first applications was the attempt by the American "Office of Strategic Services" to profile Adolf Hitler during World War II. The OSS employed a panel of psychiatrists to analyze Hitler's personality, based on

information gleaned from people who had met him. The study was classified for thirty years after the war, for a very peculiar reason: it was almost totally wrong. Releasing the study while those who had had a hand in it were still alive might have caused them severe embarrassment.

There were several reasons why the study, eventually published under the title *The Mind of Adolf Hitler*, was worthless. One is that those who decided what sort of personality Hitler had were psychoanalysts, practicing a now discredited sub-specialty akin to witchcraft and fortune-telling. Psychoanalysis depends more on intuition and guesswork than on observation.

None of the psychoanalysts who contributed to the study had examined Adolf Hitler. In the middle of a world war this was quite impossible. Arriving at a diagnosis without examining the patient is very sloppy, and any present-day medical doctor who did this would find himself being called up before the medical licensing board.

The witnesses who contributed information about Hitler were all refugees from Naziism, and their accounts were definitely biased. Some of the accounts made much of Hitler's alleged tendency toward flatulence, for example, as if this gave a useful insight into his personality. Actually, passing gas is a result of eating cabbage and other vegetables, and it was already known that Hitler was a vegetarian. There were also inferences drawn from the allegation that Hitler had only one testicle, which later turned out to be untrue. Drawing judgments based on propaganda instead of facts is not likely to lead to an accurate picture.

Finally, the information was out of date. Nobody on this side of the ocean knew about Hitler's Parkinsonism, nor his other health problems, and they assumed that the Fuehrer was in good health. His failing health was a crucial factor in the outcome of the war.

There are two approaches to obtaining a psychological profile of a criminal: intuitive and statistical. The Hitler study was intuitive.

The intuitive method was also practiced spectacularly by Dr. James A. Brussel, a New York psychiatrist who was a consultant in the "Mad Bomber" and "Boston Strangler" cases, among others. His most noted and successful case was that of the "Mad Bomber," who planted his first pipe bomb in New York in 1940, interrupted the bombings during World War II out of feelings of patriotism, and resumed after the end of the war. During his career as a bomber, he planted at least 30 bombs in various public and semi-public places in New York.

In 1956, the New York Police Department consulted Dr. Brussel to try to obtain some insights into the type of person the Mad Bomber might be. Dr. Brussel's analysis was amazingly accurate, based on the Bomber's acts and the notes he sent to the police and to local newspapers. Dr. Brussel described the Bomber as middle-aged, well-built, of Slavic extraction, living with a female relative, unmarried but not homosexual, neat in his personal habits, paranoiac, Catholic, and wearing a double-breasted suit, buttoned.⁴

This was an excellent description of George Metesky, the man whom the police finally arrested as the Mad Bomber. He was the right man, as he confessed. However, the police did not apprehend him by following the psychological profile that Dr. Brussel had drawn up. They did it by old-fashioned detective work, comparing the handwriting on the Mad Bomber's notes to old personnel files at Consolidated Edison, the utility company that the Mad Bomber claimed had once wronged him.

Another bomber case on which Dr. Brussel worked was the "Sunday Bomber," who planted much more powerful bombs that injured several people and killed one. However, despite Dr. Brussel's profile, the police never caught this bomber.⁵

Dr. Brussel found his opinion requested in the Wylie-Hoffert Murder Case, in which he stated that the killer could not have been either of the two men the police arrested for the crime. The first, George Whitmore, was a Black man who later turned out to have had an airtight alibi. The second suspect, Robles, was a heroin addict who could not, according to Dr. Brussel, have committed the crime.⁶

Intuitive profiling depends very heavily on the individual with the intuition. Some people are very good at it, but this is not a learned skill. This is why it's not a wide-spread technique. Its demonstrated unreliability suggests that the intuitive method may not see much use in the future, either. Dr. Brussel deserves credit for his honesty, for in his accounts of the cases he admits readily that his profiles did not often lead to a solution of the cases.

The statistical approach is more recent, and is the product of a few researchers who felt that it's possible to tabulate and predict behavior with statistical tools. There's some validity in this, although the limitation is that what's true for the majority isn't necessarily true in an individual case.

The method is to gather many details about many different acts, and to enter them in a database. It's then possible to print out a composite act, listing various characteristics and their frequency of occurrence. An example might be whether the assailant is male or female. A printout would disclose that males were involved "x" percent of the time and females in the rest of the cases in which the sex of the person was known.

The other part of the technique is to interview as many offenders as possible, and to ask questions about their ancestries, upbringing, toilet training, education, sexual relationships, etc. With enough data, assuming the convicted felons answer truthfully, it's possible to build up a statistical average of the type of person that commits a certain type of crime.

There have been a couple of spectacularly accurate profiles drawn, but generally the picture has been disappointing. Knowing the personality type is not the same as having a specific person in custody. Psychological profiling does not produce enough evidence to convict. The technique is still in its infancy, and claims that psychological profiling helps catch the perpetrator are premature.

Anyone deciding to start his own psychological profiling operation should be aware that obtaining the truth from suspects and those convicted of crimes is uncertain. Criminals try to turn every situation to their advantage. The experienced investigator knows that there's always a risk that the interviewee is playing games.

Some suspects may withhold information unless they can strike a "deal." Others may make damaging admissions, yet withhold certain details as an ace-in-the-hole for future bargaining. Yet others may purposely mislead investigators because of a perverse personality. Career criminals develop sensitivity for what others want to hear, and are skilled at catering to these wishes.

Some offenders, in addition to their sadistic and sexual problems, are pathological liars. Others may mislead investigators for amusement. A person convicted of a capital crime has nothing to lose by telling stories. Indeed, playing for time may even postpone execution. An offender sentenced to life plus 99 years for sex crimes can understand that his chances for parole are negligible, and also may feel that he has nothing to lose by playing games with his interrogators. Indeed, if he confesses to crimes in other jurisdictions, he may take a few trips as the guest of the state while officers interview him and check out his story.

Considering the uncertainties of interviewing serious offenders, it's best to follow a few important guidelines:

- Experienced criminal investigators should be aware of the strong possibility of a suspect's lying, either to gain an advantage, or for amusement.

- No statement from an offender should be accepted as fact without independent verification.
- Psychologists and psychiatrists may have a place in the program as consultants, but under no circumstances should they interview suspects or convicted persons.

VICAP

This acronym stands for Violent Criminal Apprehension Program, and the headquarters of the operation are in Quantico, Virginia, at the FBI Academy. VICAP is a computer-assisted pattern-seeking database, designed to discern similarities between seemingly unrelated incidents across the country. VICAP is specifically aimed at serial killers at the moment, and there's been some work done on drawing up a profile of the typical serial killer, based on those apprehended so far.

The typical serial killer is a Caucasian male, of above-average intelligence, who tends to change residences. He had a turbulent childhood, coming from a broken home, and was raised fatherless.

VICAP needs input from the 17,000 police agencies in the United States to build its database. One hard fact about any database system is that, in the early stages, results are slim. With more information, there's a larger number of incidents on which to make a "match," and the odds of spotting a trend increase. As police agencies continue to send information on their "dead-end" cases to VICAP, the database will grow.

What's available right now is a set of guidelines to help detect what might be the work of serial killers. An early warning sign is an increase in missing persons who remain missing. If there are indications of foul play in their disappearances, the likelihood increases.

Finding unidentified corpses who have been murdered is another indicator. Some serial killers prey on runaways and transients, who might have been reported missing in another jurisdiction, but who remain unknown in the one in which their corpses turn up until someone actually finds the body.

Random, motiveless murders are also the hallmark of a serial killer. Serial murderers tend to accost and kill people for reasons known only to themselves, and the usual linking motives don't apply.

Murders involving abduction are another indicator of serial killings. So are those with sexual aspects, especially if the killer is still at large.

Any killings that form a pattern indicate serial murder. Several murders with common factors suggest a similar "Modus Operandi," and this points to one person as the perpetrator.

One aspect of psychological profiling applicable to the individual case is to categorize murderers into "organized" and "disorganized" types. The circumstances of the crime suggest this split. A homicide which shows impulsiveness and inattention to danger is "disorganized." One which shows careful planning and execution falls into the "organized" category. This distinction can point the way towards a killer who is relatively sane, or one who is psychotic, in the normal sense of the word.

LINGUISTICS

In rare instances, the killer will leave a note, or otherwise send messages to the authorities. This happens in "psycho" murders, and in certain terrorist incidents. The technique of analyzing the messages for clues as to the type of person who wrote them is called "psycho-linguistics." Drawing upon the method of expression, and characteristic words and phrases, it's possible to make some educated guesses regarding the person who wrote a

particular message. There are certain words and phrases associated with ethnic groups, for example, and others that are common in certain parts of the country. Trendy phrases tend to fix the age of the writer, and the overall tone and coherence of the message suggests the educational level. It's also possible to suspect certain types of mental disorders from the way the writer expresses himself. There have been a few very accurate predictions of the characteristics of message writers, although the technique is not generally applicable.⁷

USING PSYCHICS

This is a move of desperation, when investigators have no other clues. A "psychic" is a person with alleged extra-sensory powers that allow viewing or otherwise perceiving details of a crime invisible to everyone else.⁸

The revelations of a psychic will not hold up in court. They have absolutely no evidentiary value because experience has proven the extreme unreliability of psychic reports. There have been books written about the alleged abilities of certain psychics in unraveling cases that seemed impossible to solve. There have also been conspicuous failures.

The only reason for engaging a psychic is that there are no other leads. If this is the case, it's important not to be taken in by a charlatan or obvious fraud. Some fakers simply feed back to police information that is already known. Others make up "facts." The investigating officer must be very careful in dealing with people who claim to be psychics, and closely control the information they receive to ensure that they are not simply providing feedback. Another problem relates to fees. This is one which each department will have to handle according to established policy. Some psychics will demand fees the agency can't pay. Others will offer their services on a contingency basis, or completely for free.

POLYGRAPH EXAMINATION

This is a tricky and unreliable technique, at best. The investigator should be aware that those who are "pushing" the polygraph as an investigative tool are usually polygraph technicians themselves, seeking to safeguard their livelihoods. The basic fact is that, although the polygraph has been with us since the 1920s, it has failed to find widespread acceptance in courts because scientific evidence of its effectiveness is lacking.⁹

There are several problems with the polygraph and its method of use. These also apply to the various newer devices that allegedly detect lies by measuring changes in voice pitch as stress signs. The machines themselves are constructed with obsolete technology. Operators are not uniformly well-trained. The assumptions upon which the machines work are questionable.

The most obvious point is that anyone accused of a crime, or under suspicion of telling lies, is under stress. This can easily account for the many "false positives" that occur in polygraph testing. Another problem is that some people enjoy telling lies, because their lifestyle is a battle of wits against other people, including authority figures. To them, many situations are challenges to their deceptive skills. These are the people who become career criminals and used-car salesmen. They can lie copiously without the polygraph operator's detecting it.

The situation regarding the polygraph is so bad that even a proponent of its use counsels caution, and points out that the polygraph can only be an adjunct to an investigation, not a substitute.¹⁰ The unreliability of the polygraph is such that an investigator should never base his case upon it, nor allow it to direct the course of an investigation, without other corroborative evidence.

HYPNOSIS

There's been some success in using hypnosis to help crime victims recall significant details of a crime.¹¹ However, hypnosis does not produce evidence admissible in court, for several reasons. One is that, under hypnosis, the subject is very suggestible, and can produce answers he believes that the questioner wants to hear. The effect is somewhat like that under ordinary interrogation, but much more so. An overly-enthusiastic investigator can "cue" the subject to produce the answers he's seeking. Another problem is that hypnosis is no guarantee of truthfulness. Subjects can lie. Hypnosis is also no guarantee of accuracy, even in truthful subjects. Memory is fallible, even under hypnosis.

INCOMPETENCE

Incompetence in many occupations is easy to detect. When dealing with tangible objects, ability shows itself very well, and lack of ability results in errors that are apparent and easy to document. Not so with the "behavioral science" fields. Because the subjects are intangible, there's a lot of room for error. Psychiatrists can disagree regarding the "sanity" of a defendant. Polygraph tests come out differently with different technicians. With more exotic techniques, such as hypnotism and psychic reading, the field is full of wild cards.

For charlatans and fakers, this is a "license to kill." It's impossible to prove that a hypnotist, lie detector technician, or psychic, is operating in bad faith. An unknown number are exploiting the field for what it's worth, collecting fees for questionable or totally worthless services. Some are con artists.

Others are merely incompetent. Distinguishing between the two is almost impossible.

APPROACH WITH CAUTION

The homicide investigator may need to use some of the questionable techniques described in this chapter because he lacks anything more solid. Clutching at straws is understandable, but at the same time it's necessary to avoid compromising an investigation by using questionable techniques.

Under no circumstances are any of the techniques in this chapter worth anything except as investigative leads. At best, they're unreliable and won't stand up in court. At worst, the investigator may find himself in the hands of a charlatan or an incompetent. This is why the homicide investigator must treat any of these techniques very carefully, and avoid expecting too much.

SOURCES

1. Notable Crime Investigations, William Bryan Anderson, Springfield, IL, Charles C. Thomas, 1987, p. 7.
2. Ten Riilington Place, Ludovic Kennedy, New York, Simon and Sinister, 1961.
3. Notable Crime Investigations, pp. 299-305.
4. Casebook of a Crime Psychiatrist, James A. Brussel, M.D. New York, Dell Books, 1968, pp. 19-83.
5. Ibid, pp. 101-115.
6. Ibid, pp. 116-144.

7. Practical Homicide Investigation, Veraon J. Geberth, New York, Elsevier Science Publishing Co. Inc., 1983, pp. 415-420.
8. Ibid, pp. 420-426.
9. Interrogation: A Complete Manual, Burt Rapp, Port Townsend, WA, Loompanics Unlimited, 1987, p. 101.
10. Practical Homicide Investigation, p. 396.
11. Ibid, pp. 390-393.

PRESS RELATIONS

Press relations can be critical during a homicide investigation, especially if the case has sensational aspects. Officers may at times feel besieged by media people, so much so that it interferes with their jobs. A complicating factor is that some on both sides hold antagonistic attitudes. Some officers feel that the media will portray police in a bad light whenever possible. Some media people see police officers as excessively secretive to cover up their corruption or incompetence. What makes it worse is that there are a few on both sides who justify such viewpoints by their behavior.¹

Enlightened police officers realize that media people have their jobs to do, just as police officers have theirs, and that there can be a mutually beneficial relationship. This is especially true in small departments, because relationships between press and police can be more personal.

Large agencies have press relation officers who work full-time with the media, writing releases, answering questions, and obtaining interviews with specific officers when necessary. In a small department, it's almost literally true that each member has to be his own press relations officer. The officer on the scene has to exercise the same tact with the media as he must with the public.

In many cases, it's enough to explain to reporters on the scene that walking into the crime scene risks destroying evidence.

Reporters also quickly understand that releasing the victim's name before notifying the family is poor practice. In turn, they expect that the officer will be open and fair with them, providing the information they need to write their stories before the deadline.

INFORMATION TO RELEASE

Legitimate items to release are:

Location of the incident.

Date and time.

Name of victim, after notification of family.

Type of weapon.

A summary of the incident, including motive, if known.

Names of any arrestees, and the charges filed.

Names of officers pursuing the investigation.

A question the officer must ask himself about every item of information is whether it will harm his case if disclosed. The reasons for this caution are complex. Let's consider them in detail.

PITFALLS AND PROBLEMS

The media earn their money by promoting readership and viewing, because this stimulates advertisers. Publishers, editors, and reporters know that a sensational topic is an attention-grabber, and attracts the audience away from the competition. This is why the media tend to sensationalize the news, often beyond good taste and decency. We see this effect less in small towns and in rural areas because the media people live among their audiences, and have to face the disapproval of those who object to the way they present the news.

"Trial by newspaper" is an old and disreputable American institution. Libel laws tend to restrain the media, because they can be sued for publishing false accusations. A newspaper carrying the headline "John Jones Guilty of Murder" can wind up on the business end of a large libel suit if the accusation is untrue. This is why the news media are careful not to make direct accusations, and instead attempt to suggest and insinuate.

One way of publishing a sensational accusation is to attribute the information to a public official. A headline that reads "Detective Smith Alleges Jones Guilty" gets the reporter off the hook and places the load directly on Smith's shoulders. This is why it's vital for police officers to think carefully before making any statement to the news media. Certain types of statements are dangerous because they may lead to unfounded accusations, and expose the officer and his agency to lawsuits.

The officer dealing with the press should stick to the facts, and always avoid inserting his opinions into the discussion. Specifically, he should avoid comment on a suspect's character or reputation, and he should avoid revealing or discussing statements made by the suspect or a witness. The officer should also avoid speculating on whether or not the suspect will be apprehended, and the possible outcome of a trial.

Discussing the evidence in detail is also inadvisable. This is both to avoid a trial by newspaper and to withhold certain facts known as "investigative keys." These are details regarding the crime that none but the police and the guilty party would know. They serve as authenticators for a suspect's confession.

Reporters, always conscious of their deadlines, will naturally press the officer for information which he may not have, or be unable to release. A good answer, which usually won't offend, would be along these lines:

"We're still in the early stages of the investigation, and don't have the basic facts sorted out yet. Ill be better prepared to give you a statement in an hour (or two, or three)."

An important point is never to pose for photographs for the press. This applies especially to posing with the suspect, if any. There should be no effort to stop press photographers from taking photographs of a suspect in custody, but no interviews with him should be allowed.² These points have their limits. Photographs of the suspect are legitimate when he's in a public place or otherwise open to view, but the press should not have free run of the police station or the jail to take photographs. Interviews with the suspect are only inadvisable in the early stages of the investigation. After the suspect's been booked and consulted an attorney, he and his attorney may demand that the press see him. It's politically difficult to obstruct such a request.

THE PRESS CAN HELP

Officers who foster a good relationship with the press work on the basis of credibility. This can be rewarding, because in many cases taking the press into confidence can elicit cooperation. Reporters who discover the identity of the victim by monitoring the police radio often understand the need to avoid publishing prematurely to spare the relatives the pain of finding out through the media. Likewise, certain details of the case which officers prefer to keep quiet are also available to reporters, from interviewing witnesses and through other sources. If the relationship between police and press is good, officers can often obtain excellent cooperation. The quality of the relationship sometimes depends upon sharing confidences. The technical term for this is "background information." This means a briefing not for publication. For this to work, there has to be a certain amount of trust between the police and the press.

Another type of cooperation is publishing a request for help from the public. The media can publish photographs of the "Has Anyone Seen This Man?" type, and list telephone numbers to call with information. A description of an unidentified victim,

with an appeal for anyone who recognizes the description to contact the police, can also promote an investigation in some cases.³

Police and press have a few important things in common. Both deal in information, for example. Both gather and process information for others to absorb and to use. A striking resemblance occurs in the protective attitudes both have towards their sources of information. Police officers protect their informers, and reporters protect their sources. Both can understand the other's need for discretion at times, and this can provide the basis for mutual confidence.

SOURCES

1. Chief, The Reporters Are Here, Gerald W. Garner, Springfield, IL, Charles C. Thomas, Publisher, 1987, pp. 3-12.
2. Practical Homicide Investigation. Vernon J. Geberth, New York, Elsevier Science Publishing Co. Inc., 1983, p. 330.
- 3.

PART III: TOOLS

TOOLS FOR THE JOB

COPY MACHINE

A small and portable copy machine is worth having in order to make instant copies of reports and other documents in an investigation. The smallest models weigh about 25 lbs. and fold up into very compact packages that an investigator can lay on the seat of a car. The small Canon and Sharp models cost roughly five hundred dollars on sale.

COMPUTERIZED AIDS

AFIS (Automated Fingerprint Identification System)

This recently emerging technology allows searching and comparing single fingerprints. Until now, single prints posed an impossible search problem unless the search list was originally very small, such as a short list of suspects. AFIS allows a computerized search of single fingerprints on file to obtain a match with one found at a crime scene.

Comphotofit

This is a computerized tool for creating electronically-generated facial photographs, following witnesses' descriptions.

This device is not a program, to load into a standard desk-top computer, but a combined hardware and software system. It recalls facial features from a large electronic memory to provide billions of possible combinations. The composite images also have adjustments for skin tone, and another feature is a computer-generated pseudo "flesh tone" for a more natural look.

Images stored in the computer's memory include forehead, eyes, nose, mouth, and chin sections. There are also accessory images, such as mustaches, beards, eyeglasses, and headwear. The operator can place these on the image to fit the witness's description. With custom software, he may insert scars, wrinkles, and moles, move eyes apart or closer together, or reshape a hairline.

A Polaroid Freeze Frame Image Recorder provides an instant color print of the screen. Finally, a Toshiba P321 high-resolution dot matrix printer provides a halftone image on paper. All of these imagers can produce both line and tone, for type and photo on one sheet.

The COMPHOTOFIT System is available from:

AXIOM RESEARCH CORPORATION

3632 North Boulevard

Raleigh, NC 27604

Phone:(919)878-9115

Computer-AssistedDispatch

This can provide a head start in developing information in a case. CAD stores and automatically displays relevant information for each address to which an officer is dispatched. This allows the officer to see the history of a particular address, and know whether there have been similar calls in the recent past. For example, knowing that a couple at the address has a history of family fights can lead the investigation in that direction if one party is murdered. While this information is not proof, and at times can even be misleading if the officer jumps to conclusions, it's better than going in "blind."

Computer-Assisted Dispatch is sometimes available to small departments. In certain instances, a small department finds it uneconomical to set up its own radio dispatch, instead choosing to contract for this service from a large neighboring or regional agency. If the large agency has CAD, this is a bonus, providing a service that the smaller one could never have afforded on its own.

The Computerized Database

In an investigation, it's often necessary to sift through F.I. (Field Interrogation) cards, arrest records, and other records in the hope of finding a lead. A computerized database can accelerate this process tremendously. With a computerized database, it's not necessary to go through all of the records, but merely call up the ones that fit the situation. If witnesses state that the suspect was a white male about 25 years old, officers can recall records fitting this profile only, instead of poring through all that apply to a particular time frame or geographical area.

Databases are available for even the small mini-computers that the smallest agencies can afford. These can be inexpensive general databases, or customized police-style databases.

The Mobile Data Terminal

The MDT, or Mobile Data Terminal, provides a way for officers to obtain information from a central records facility without going over the conventional radio net. The individual installation in the patrol car is a data terminal consisting of a keyboard and screen, linked by UHF radio to the central location. The officer can use it to check driver's licenses, auto registrations, "wants," and obtain other information. One of the practical benefits is that once the officer "keyboards" the information request, response time is very rapid. Under good conditions, the answer comes back in a few seconds. During peak traffic loads, it can take up to 30 seconds to get a response.

Mobile Data Terminals require a multi-million dollar installation, including a mainframe computer, a back-up, a hard disc recording system and tape back-up, and a mobile terminal in each car. However, the cost becomes much less when a small agency accepts area-wide dispatch from a central location. The cost is then only for the terminal in each car and a pro-rated share of the central installation.

DNA FINGERPRINTING

This new technique offers the prospect of identifying an individual and placing him at the scene of the crime through a very small tissue, blood, or semen sample. In the United States, a private laboratory offers sample analysis:

CELLMARK DIAGNOSTICS

20271 Goldenrod Lane

P.O. Box 1000

Germantown, MD 20874

Phone: (800) USA-LABS

A letter or phone call will bring detailed information regarding fees, sample handling and packaging, and turn-around time.

Note that the FBI will soon be offering DNA analysis for a limited number of clients.

EVIDENCE KIT

The contents of this kit depends on whether the investigator decides to include a sketching kit and a fingerprint kit in the package, or whether he feels that these should be separate. Here, we'll keep them separate to allow for maximum flexibility.

It's possible to purchase a pre-assembled evidence kit from a police supply house. These usually come in a handsome case, and have pockets, drawers, or loops for various items. They're also very expensive, costing almost a thousand dollars. Many of the items they contain are commonly available, but are included in the kit at a high markup. The small department with a limited budget can obtain most of the items from local sources, such as a supermarket or hardware store, and avoid the additional markups. A machinist's toolbox or plastic fishing tackle box can hold the contents neatly, without the expense of a custom-made kit.

Notepads. An investigation consumes paper, and the investigator's personal notepad may not be enough.

Evidence labels and tags. These should include self-adhesive labels, as well as tags attaching with strings. It's fairly inexpensive to have these pre-printed.

Evidence envelopes, both paper and plastic. Sandwich bags, both fold-over and "Zip-Lock," are inexpensive items.

Evidence vials and bottles, both glass and plastic. Plastic will do for biological products, dirt and mud, and other samples, but any sample containing petroleum products may be affected by plastic.

Tape, both surgical and cellophane.

Pens, both roller ball and marking.

Carbide scribe. This is for marking identifying initials on small metal items, if departmental regulations require it. A marking pen will do for larger items.

Gloves. Several pair of light cotton gloves and a couple of pairs of heavy work gloves should be included.

Tongs, for picking up evidence. Barbecue tongs will do for this.

Tweezers.

Cotton swabs. Very inexpensive in discount stores.

Distilled water. A small bottle, two to four ounces, is enough. This is for moistening and picking up samples of blood and other water-soluble substances.

Tonguedepressors.

Toothpicks.

Disposableplasticeyedroppers.

Mini-flashlight, with extra batteries.

Inspectionmirror.

Magnifyingglass.

Ball ofstring.

Hammer and nails.

Pliers, both conventional and needle-nose.

Channel-lockpliers.

Single-edgerazorblades.

Utilityknife.

Set of screwdrivers, or screwdriver kit with interchangeable bits.

Wirecutters.

Prybar.

Militaryfieldspade.

Keyhole saw.

Extension cord

Papertowels.

Anti-putrefaction mask (Bureau of Mines #23B-17). This can be vital when dealing with decomposed cadavers.

Coveralls or disposable jumpsuits. These are available from:

CRIMINAL RESEARCH PRODUCTS, INC.
P.O. Box 408
Conshohocken, PA 19428-0408
Phone: (800) 635-5225

FINGERPRINT KIT



This can be part of a larger evidence collection kit, or a small and self-contained unit. One compact kit is the Sirchie Compact Latent Fingerprint Kit, which contains a vial of black magnetic powder, black non-magnetic powder, a camel's hair brush, a magnetic applicator wand, a small Poralon ink pad, a magnifying glass, lifting tapes and a compartment with cards, evidence tags, and fingerprint ink cleaning towelettes. This kit is for developing latent fingerprints at the crime scene and for taking

exemplars from people whose prints need to be eliminated from the scene. The kit is available from:

SIRCHIE FINGERPRINT LABORATORIES
UMSTEAD INDUSTRIAL PARK
P.O. Box 30576
Raleigh, NC 27622
Phone:(800)356-7311

This small Sirchie kit does not have a light-colored powder, which is necessary for best results on dark-colored objects.

Cyanoacrylate fuming chemicals and applicators are worth including because cyanoacrylate helps preserve latent fingerprints vulnerable to damage. These products, under the trade names of "CYANOPRINT," or "LOCTITE," are available from many law enforcement supply houses. The "Omega-Print" compound is available from Sirchie Laboratories.

For local use, a similar product is available in a spray can. The material is called "Spray-Print," and is available from:

PRINT-LOCK
8055 West Manchester Avenue
Suite 405
Playa Del Rey, CA 90293
Phone: (213) 827-7787

A fingerprint recording camera that has its own self-contained lighting and a Polaroid back is available from:

ACE FINGERPRINT LABORATORIES, INC.
P.O. Box 288
Wake Forest, NC 27587-0288
Phone: (919) 790-5041

IMPROVISED FINGERPRINT POWDERS

In a small department, it may not be possible to maintain supplies satisfactorily. Talc, of the sort found in body powder, serves as white latent fingerprint powder in a pinch. Powdered graphite, sold in hardware stores for lubricating locks, is an excellent black fingerprint powder.

INFECTION PREVENTION KIT

There are several of these available for police use, but most are designed for safe mouth-to-mouth resuscitation. A kit specifically designed for the officer who has to handle possibly infected persons and evidence is the "Health Maid." This contains gloves, disinfectant solution, towels, and other items to protect the officer. These kits are priced in the five dollar range, depending upon quantity, and are available from:

HEALTH MAID, INC.
135 East 7th.
Roxana, IL 62084
Phone: (618) 254-0285

SKETCHING KIT

A crime scene sketching kit can be simple, and fits in a small 8 1/2" x 11" portfolio or a loose-leaf notebook. The essentials are:

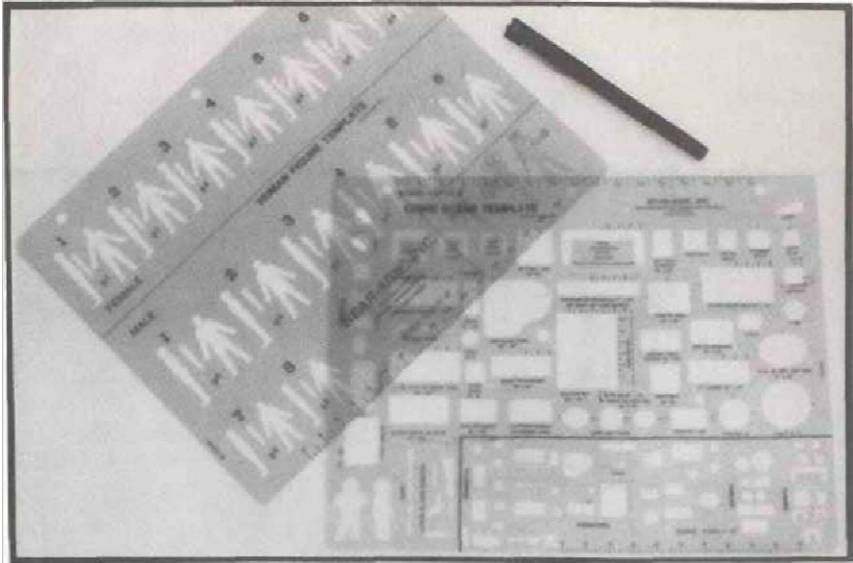
50-ft. measuring tape.

Graphpaper.

Crime scene sketching i

Pens or pencils.

Plastic point or roller ball pens are best, because they produce clean black lines without ink smears. This can be very important if it becomes necessary to photocopy any sketches. Pencil lines are often too light to copy well, although pencil is erasable. However, the investigator may choose to make the first sketch in pencil, and once he's sure there are no errors, go over the lines with black ink.



"Bear-Aide" Crime Scene Templates are three-hole punched to fit in an 8 1/2" x 11" loose-leaf, and have outlines of furniture, plumbing fixtures, human figures, and weapons. The template has two sections, one to scale 1/4" = 1 ft., and scale 1/10" = 1 ft.

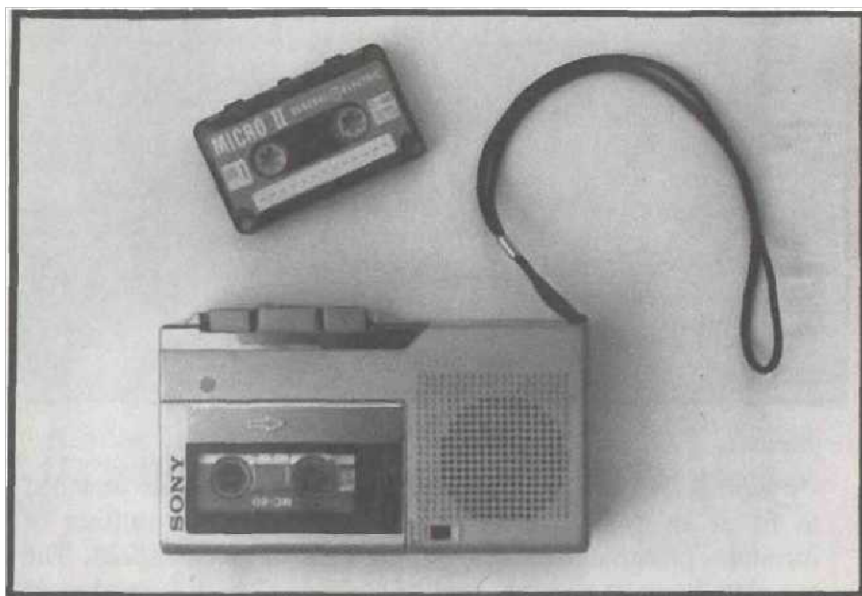
The Bear-Aide Human Figure Template is made to scale 1/4" = 1 ft., and has seven frontal and profile outlines of females spanning the range from 4'6" to 6'3". Eight male figures cover

from 4'6" to 6'6". Male and female figures are differently proportioned. A scale ruler is on one edge of each template.

Bear-Aide templates are available from:

BEAR-AIDE, INC.
P.O. Box 27086
Tempe, AZ 85285-7086
Phone:(602)831-0834

TAPE RECORDER



Micro tape recorders are cheap enough for every supervisor and criminal investigator to have one on hand. They offer convenience in taking notes and dictating reports. They also

provide a way of taking a statement, dying declaration, or confession that is very convincing when played back.

It's possible to use a large tabletop machine for taking formal statements, but on the scene a micro unit is more convenient. Cassettes typically record 20 minutes per side. A set of alkaline batteries lasts for several hours' recording and playback.

GLOSSARY

Antemortem — Before death.

Arsenic — A common poison. Although arsenic is an element, poisoning is usually with an arsenic compound, such as arsenic trioxide, a white powder.

Asphyxiation — Oxygen starvation, often fatal.

Autopsy — A forensic medical dissection of the corpse, made to discover the cause of death.

Barbiturates — A class of sedatives and anesthetic agents, sometimes used for suicide. Rarely used for murder. Commonly used in legal executions.

Blunt trauma — Physical damage caused by blows from a blunt instrument, which do not necessarily break the skin. Can be fatal.

Bondage — A slang term for restraints used for sadomasochistic pleasure. Sometimes involved in sex murders. Often involved in masturbation deaths.

Cadaver — Corpse.

Cadaveric spasm — Rigidity of a muscle group after death. This is different from rigor mortis.

Carbon monoxide — The single oxide of carbon, a gas formed by imperfect combustion, and often found in automobile engine

exhausts. Some people commit suicide by running their car engines in a closed garage or running a tube into the car body. Carbon monoxide combines with hemoglobin, forming carboxyhemoglobin, and preventing the blood cells from carrying oxygen.

Carotid arteries — The two arteries in the neck, conducting blood to the brain. Severing these causes quick unconsciousness and death.

Cement boots, concrete overcoat — Methods of weighing down a murder victim so that he won't float to the surface.

Coagulation — Refers to blood clotting.

Confessor — A person who confesses to crimes he hasn't committed. There's a small, but troublesome, minority of deranged persons who have a compulsion to confess to the police.

Contact wound — Gunshot wound in which the muzzle was in contact with the skin.

Contrecoup — French term meaning "counterblow." An injury to the opposite side of the body from the site of an impact.

Decomposition — Rotting of the body.

Defenestration — Throwing out of a window. Not often used for murder, but when it happens, it can be difficult to distinguish from suicide.

Defense wounds — Slashes on the hands or forearms from trying to block or parry an attack with an edged weapon.

Disinterment — Digging up a corpse. Exhumation.

Entrance wound — Wound where a bullet or missile entered.

Exemplars — Fingerprints obtained from a list of people for the process of elimination.

Exit wound — Wound left by a bullet or missile's leaving the body.

Fetish, fetishism — Unnatural use of an object to arouse sexual desire. Fetishism is an attraction to a non-sexual object, or part of the body. This is often part of a sex crime.

Floater — Partly decomposed body found in river, lake, or sea. The victim, although originally weighted down and sunk, eventually comes to the surface because of intestinal gas, hence, "floater."

Grave wax — Common name for "adipocere," a waxy substance which appears on the skin of cadavers in humid atmosphere.

Hematoma — Local swelling from ruptured or severed blood vessels.

Hit — Gangland slang for a contract killing.

Hit Man — A contract killer, usually a professional on retainer to organized crime.

Infanticide — Killing an infant soon after birth. Often used as an alternative method of birth control.

Infibulation — Piercing the genitals with needles or rings. This is usually found on the male genitals, and very rarely on females. Often a sign of sexual perversion, and indeed a small sexual subculture uses implanted rings and other objects as sex toys or aids.

Inshoot — Synonym for "entrance wound."

Jugular veins — Two veins in the neck, providing return flow from the brain. This term is used by some people who really mean "carotid arteries."

Laceration — Tearing or ripping of skin.

Latents — Short for "latent fingerprints." Fingerprints found at a crime scene, in contrast to fingerprints obtained with ink and

paper. Latents have to be developed by an investigator or technician to allow photographing or "lifting" them.

Linking motive — A motive for murder that clearly points toward a specific suspect. Robbery is a motive, but doesn't single out a specific person. Profiting from an inheritance highlights the heir.

Masochism — Sexual pleasure derived from receiving pain. This sexual perversion very rarely leads to death, but some sexual killers seek out masochists, gain their cooperation, and finish them off when they're tied up and helpless.

M'Naghten Rule — Insanity defense that the defendant did not know the nature and consequences of his actions, or did not know that they were wrong. Often mis-spelled as "McNaughton" or "McNachten."

Mechanic — A contract killer, synonym for "hit man."

Multiple killer — One who kills more than one person during the same session. Not to be confused with "serial killer," who kills more than one victim at intervals.

N.G.R.I. — Not Guilty by Reason of Insanity. This is a defense brought up in some criminal cases.

Outshoot — Synonym for "exit wound."

Petechial hemorrhages — Tiny, pin-point hemorrhages under the eyelids, which indicate death by suffocation or strangulation.

Post — abbreviation for postmortem examination, or autopsy.

Post-mortem or postmortem — After death.

Powder deposits — Combustion products from "gunpowder," firearms propellant, resulting from firing or being close to a firearm when fired.

Psychiatrist — A medical doctor specializing in mental disorders. While the licensing laws of many states allow any doctor with a medical degree and a medical license to call

himself a "psychiatrist," a legitimate psychiatrist has passed an examination conducted by the state specialty board or the national organization, the American College of Psychiatry.

Psychologist — A non-medical specialist in behavioral science. A psychologist is usually a Ph. D., although some behavioral scientists are other types, such as "MSW," Master of Social Work.

Psychotic — Out of contact with reality due to mental disorder.

Putrefaction — Decomposition, rotting of the body.

Rape-murder — A killing occurring during or after a rape, to overpower resistance or because of a need to kill for sexual pleasure. Some rape-murders, however, take place because the offender wants to prevent the victim from identifying him.

Res Gestae — The facts of the case. Legal term, taken from Latin.

Rigor Mortis — Stiffening of the body, usually starting between two to four hours after death and lasting for 24 to 48 hours.

Ritualism — A term used to denote specific patterns in murder, such as those found in satanic acts.

Sadism — Sexual pleasure derived from inflicting pain. This term is not a synonym for "cruelty," inflicting pain or harm for other reasons. Sadists rarely inflict enough damage to kill their victims.

Satanism — Worship of Satan. Occasionally involves a murder or mutilation.

Serial killer — One who kills many victims, usually one at a time, over months or years. Not to be confused with "multiple killer," who kills all of his victims at once.

Snuff film — A pornographic film or videotape purportedly showing a person being killed. These are produced for sadists who "get off" on violence, and are most likely staged deaths, not films of actual murders.

Strangulation — Cutting of breath and blood flow to the brain by constricting the neck.

Toxic — Poisonous or harmful.

Trauma — Injury or wound.

Trajectory — The path of the bullet after it leaves the weapon.

VICAP — Violent Criminal Apprehension Program. This is run by the FBI to track serial killers and detect patterns in unsolved murders. It will eventually encompass other types of violent crime, such as rape and armed robbery.

Vomit aspiration — Breathing in of vomit, obstructing respiration.