Homicide Scene Investigation

A Manual for Public Prosecutors

PREFACE

Searching for evidence, and the proof of a case, that can be taken to the courts as a result of the inspection and analysis of a crime scene does not only depend upon the legal knowledge of a prosecutor or investigator. It also requires experience, practice and training in the dynamics of investigating the crime scene. It is this combination that creates the possibility for truly enforcing the law and maintaining justice, particularly when we deal with the crime of homicide. To hone these skills, the Crime Scene Investigation Manual was created through the joint cooperation of the Public Prosecution and the DPK Rule of Law Project. This cooperative process aims to make it easier to reach the goals of the Attorney General's office, and to make justice a reality.

All the elements and techniques illustrated in this manual were included so that our office could practice at the highest standards. These standards must be reached during the performance of our duties. When we reach this level of advocacy we will be able to bring justice and the rule of law to our people. .

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HOMICIDE CRIME SCENE INVESTIGATION

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Introduction

Solving crimes is an easy thing to do in most cases; proving them is sometimes not. Trying the criminal case is the hardest of all lawsuits. Why? Because convicting a human being of a crime means that there are dire consequences for that person. No one, even the hardest-hearted judge, wants to put someone in jail or have them, in the worst scenario, executed, unless they are absolutely sure that the persons who are the target of the investigation and trial are guilty. For that reason a criminal case has a much stricter burden of proof than a civil case. And for murder cases, because of the dire consequences to a defendant, a criminal homicide can be the most difficult case in the criminal lexicon to prove.

However, this is not necessarily the case. If the police and the prosecutor do their job, investigate the cases as they should, know what has to be proved, and how to prove it, a murder case can, and should be, as simple as any case to obtain a conviction. In fact, it may be even easier. To that end, we will examine criminal homicide both in its legal ramifications and in its investigation and trial aspects.

Criminal Homicide: An unjustified or non-excusable homicide is a criminal homicide. [*]

CRIME SCENE INVESTIGATION AND ANALYSIS

The analysis and "rebuilding" of crime scenes is a very specialized field. The expertise involves knowledge of crime scenes and crime scene investigation, bloodstain pattern interpretation, evidence analysis**,** and familiarity in reading and interpreting conclusions, particularly from an autopsy protocol**.** Often, in order to accurately evaluate a crime scene, the prosecutor or chief investigator is compelled to work with the medical examiner, the firearms expert, a serologist, and a trace evidence analyst, among others. No one person can formulate all the opinions necessary for an accurate reconstruction.

Some crime scenes involve too much movement or too many events to lend themselves to a complete reconstruction. This is particularly true with cases of multiple injuries and multiple victims. Crime scenes that involve movement of both the victim(s) and the suspect(s) and a multitude of injuries may make it impossible to identify and sequence all the movements and positions of the parties involved**.** In cases such as this, limited

[*] Consider the following aspects of criminal homicide: Murder: the killing of another human being with malice aforethought. Premeditation is often included in the definition most of the time to indicate degree or severity of the murder. There must be a) a death of a human being b) Death must result from the action initiated by the defendant, either directly or indirectly (e.g. A direct act: Shooting a person to death. An indirect act: Supplying the murder weapon to someone knowing what that person intends) c) An intention to murder, or to intend the act which results in death, reflecting the necessary mental attitude to sustain the charge. Murder, in many jurisdictions is broken down into lesser degrees of severity (1st degree, 2nd degree), manslaughter and excusable/justifiable homicide.

information may be gained depending on the issues of the case. And beware when experts assert they can reconstruct all events in a crime.

Crime scene photography is often the limiting factor in whether a reconstruction can be done. Although it is preferable for your expert to have evaluated the actual crime scene, it is not imperative. Certain detailed photographs are needed in the attempt to document any patterns that may be interpreted. When critical photographs are missing an accurate interpretation is not possible. Photographs typically needed for crime scene reconstruction include:

- Photographs of pattern evidence, such as bloodstain patterns, taken with the film plane. Note: a scale/ruler should be included in the majority of photographs to give an accurate perception to the items in the photo.
- Photographs of the ceiling and the walls in the vicinity of the victim's body;
- Photographs of areas where there is no blood;
- Photographs of the victims in his original position taken from various angles;
- Photographs of the area under the victim's body and under any other large moveable objects. Remember, large objects conceal items.

To evaluate a crime scene for potential reconstruction, the prosecutor needs to have specific questions that need to be answered in the case. "What Happened?" is not specific enough as an analyst's question.

For example, a man is shot in an alley in the evening hours. A witness, 50 meters away, says he saw the suspect shoot the victim twice, then drive away. The witness is an older man who wears glasses. These facts present a problem for a prosecutor. Obviously, the witness' perceptions need to be corroborated to firm up his identification. To do that we have to use the physical evidence we can gather from the scene (including the body) to bolster the I.D. Utilizing the autopsy protocols, an evaluation of the vehicle (perhaps days after the crime), the crime scene photographs, blood stain pattern interpretation, the firearms exam, serology, etc. you may be able to reconstruct the events, and substantiate needed portions of the witness's account. Remember, you are not required to reconstruct the whole event.

Sometimes it is best to regard a case as a puzzle: You begin to put the pieces together until a picture emerges. You may not have the whole picture, the whole face and body, but enough may emerge to enable you to say with assurance not only that a crime was committed but also that the defendant is the individual whose face is emerging from the puzzle.

There is another way to approach this issue: Naturally, we think as prosecutors or police investigators. We try to build a case, as we have been taught, gathering those pieces of admissible evidence to allow us to charge and to subsequently present in court. We would suggest, however, that you also approach an investigation from another perspective: that of the potential defense counsel. The defense lawyer has the

responsibility to defend his client. This means exploiting the holes or defects in any prosecution case in order to create a doubt in the mind of a sitting judge that a defendant has committed the crime. Or, at the least, generating a perception in the mind of a sitting judge that a lesser crime has been committed by the defendant rather than the higher conviction you are seeking.

If you adopt this perspective you may expand your own areas of perception that will allow you to create a stronger case. Let us use the example (above), of the witness seeing a person shoot another in a darkened alley. Of course, the defense counsel will point out the physical conditions affecting the observation, the lack of ability to accurately identify the suspect, the physical disabilities of the witness, including age and poor eyesight, perhaps there was even prior contact between the witness and the defendant which will be used by the defense counsel to disparage the witnesses ability to be honest about the event, such as prior bad relations.

Evidence generally does not sit up and bark at you like a dog to inform you it is "evidence". As prosecutors and investigators *you* must first develop the ability to *see* evidence, you must be able to *find* evidence, and finally have the skills to persuade the court to consider, and have admitted, all relevant evidence.

A few more items to consider: We have two types of evidence: direct and circumstantial. "Direct evidence" is that which we directly observe without any intervening events. Circumstantial evidence are those items from which we can infer events or derive conclusions from. The classic example differentiating the two is the following hypothetical:

> "The witness stands outside a closed room. He hears a shot come from inside the room and a brief moment later a man comes running from the room, a smoking gun in his hand. The witness goes into the room and sees an individual lying on the floor with what appear to be a gunshot in his forehead. There are no other doors or windows in the room."

What is direct evidence? The sound of the shot ("I heard a shot"). A man comes running out of the room ("I saw a man come running out of the room carrying a smoking gun"). The body lying on the floor ("I saw a man lying on the floor with what appeared to be a gunshot to the head".) No other windows or doors to the room. No other gun on the floor. All of these are direct items of evidence: those that were immediately observed by the witness. However, the witness who saw the man run from the room did not directly see any killing, so he cannot testify to that fact. He can only testify to the facts surrounding the event he *directly* perceives.

What is circumstantial evidence? It is best explained by what it is not – it is not direct evidence from a witness who saw or heard something. Circumstantial evidence is a fact that can be used to infer another fact. Indirect evidence is that which implies something occurred but doesn't directly prove it; it is proof of one or more facts from which one can find another fact or chain of facts indicating a person is either guilty or not guilty.

In the example above without doors or windows in the room; with the body lying in the room; with the man running out of the room, the gun still in his hand, we can infer another fact (circumstantially), that the man running out of the room shot the man laying on the floor in the room. We have inferred he did the killing.

One additional small example: A husband hires another man to kill his wife and gives the intended murderer a large amount of money to commit the homicide. What is direct? What is circumstantial? The man who is supposed to do the killing can testify to the direct fact that the married man paid him money for a contract killing. The fact that the husband drew a large sum of money from the bank just before the meeting with the person he hired to kill his wife is indirect (or circumstantial) evidence that he had withdrawn the money to pay the killer.

A small caution: Both types of evidence are admissible. However, the connection between the fact and the inference (in circumstantial evidence) may be too weak to help decide the case. In that instance the court may not consider it.

Again, using our example of the witness to the events around the shooting in the room, we have to revisit it as a defense counsel in light of the concept of circumstantial evidence. Why? Isn't the witness, the gun in the hand, the closed room enough to convict? Possibly. But, if we are relating to these events like a defense counsel perhaps we might perceive that the man who ran out of the room was fearful for his life. Or, that he had shot the dead man in self-defense. Or perhaps the defendant might assert that the dead-man was going to commit suicide and he (the defendant) tried to take the gun from him, but it went off in the struggle. With this scenario, the defendant ran out carrying the gun to prevent any other suicide attempt (if he thought the man was not dead) and was trying to get medical help.

Come back to this example after you have read the rest of the manual. Determine what you would do to prevent any defenses and/or strengthen any of the examples above. The facts are either possible, or not, probable or not, extraordinary and/or improbable. What we do is to try to develop those circumstances and pieces of evidence that assume the character of irresistible evidence: evidence that is so strong that no judge can possibly ignore it no matter what the defense is.

Another Approach to Evidence:

Points must be carefully examined in order to form a correct opinion. The first question might be: is the fact possible? If so, are there any circumstances that render it impossible?

Assume, in the example of the man running out of the room with the gun, as above, the body in the room has no powder burns on a wound to the temple. How could there have been a struggle for a gun that went off at close range with no powder burns on the wound? The shooting must have taken place from a distance; hence, no struggle.

With that in mind, let us go to a few other evidentiary concepts before we begin our physical investigation/site investigation techniques.

If the probative value of evidentiary material outweighs any "side" or extraneous, prejudicial weight of the evidence, it is admissible if it, for example, goes toward proving that a person committed a crime or other act when relevant to prove some *fact* such as:

- Motive
- Opportunity
- Intent
- Preparation
- Plan
- Knowledge
- Identity
- Absence of mistake or accident
- Consent or non-consent (i.e., in a rape case) [*]

A few more items to keep in mind: We accept the fact that only *relevant* evidence is admissible. Relevant evidence is any evidence tending *in reason* to prove or disprove any disputed fact that is of consequence to the determination of the action. Much of the time the relevance of an item of evidence is dependant upon the existence of a preliminary fact, or facts, such as personal knowledge, authenticity of a writing, identity of the declarant of a statement, chain of custody, a witness' expert qualifications, etc. Your task as a trial lawyer is to establish this foundation – to prove the existence of the preliminary fact or facts, which links the item of evidence to a disputed issue in the case.

Exhibits: These fall into two categories:

- Real Evidence – includes the actual, tangible exhibits involved in the case. Almost invariably they are intrinsically relevant and are admissible if the prosecutor can show that this is what it purports to be.

  Examples: Gun or a knife used in the attack; blood samples; written or taped statements of the defendant or witnesses, etc.

- Demonstrative Evidence – Evidence that is not the actual object itself but represents, illustrates, or corroborates the real thing.

  Examples: Replicas of stolen items, such as photos, diagrams, maps and diagrams of the scene, etc.

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[*] Add to the list of admissible areas of evidence, particularly on cross-examination or on presenting rebuttal.: Credibility of a witness, ability to perceive or non-perceive, bias or other interest, consistency or inconsistency of statements, existence or non-existence of a fact, evidence or a defendant's character or a trait (i.e., for violence) under certain circumstances; or to rebut evidence adduced by the defendant, admissions of untruthfulness, attitude toward giving testimony.

[*] Note: Real and demonstrative exhibits must meet the certain requirements before they can be admitted into evidence.

Trial Suggestions In Presenting Exhibits/Evidence:

- If you use exhibits make sure they are not repetitive and/or boring. They should be professionally prepared (consider enlargements, use of color, overhead projections, etc)

- Anticipate how the defense will attack and possibly use your exhibits to their advantage.

- Establish a foundation for tangible objects, i.e., clothing

    1) The witness recognizes the object and is able to identify it;

    2) The witness knows what the object looked like on the relevant date and time;

    3) The object accurately reflects the way it appeared on the relevant date and time.

With these concepts in mind, let us move forward into the area of investigations and the processes that may be used toward making any court outcome a successful one:

Creating a Successful Outcome of the Case: The Beginning

The specific questions facing any investigation at its beginning will vary according to the circumstances of any singular case. It is important that our questions relating to a crime be asked prior to the evaluation of any case and before any strong conclusions are reached. It is neither desirable nor ethical to formulate a theory and then attempt to only validate *your* theory. Listen to all the facts, evaluate the crime scene, read the autopsy results. If you have laboratory results, review them. It is the totality of the evidence that counts.

Again, let us go back to our killing in the room where the defendant runs out with the gun in his hand: Was the gun recovered, and if so was it evaluated by ballistics? Any fingerprints on the gun? Automatic or revolver used? Casings evaluated? Were powder residue tests done on the suspect's hands? There are many answers, but to get to the answers the questions must first be asked. The following are a few other important questions:

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[*] Note: Real and demonstrative exhibits must meet the following requirements before they can be admitted into evidence: 1) The qualifying witness must be competent by having some first hand connection to the exhibit; 2)The exhibit must be relevant; 3) The exhibit must be authenticated.

- Where was the victim when the attack occurred?
- Where was the suspect positioned during the attack?
- Is the amount of blood or the blood patterns on the suspect's clothing (or lack thereof) consistent with the attack?
- How many shots were fired (knife wounds, blows, etc.) and are the patterns consistent with the wounding detailed in the autopsy report?
- Was there significant movement through the crime scene by either the victim or the suspect during the attack? Furniture upset or broken?
- Are the suspect's statements consistent with the evidence?
- Are the witness' accounts of the events consistent with the evidence?
- Were there any attempts to clean up or alter the evidence?
- Is it homicide, suicide or self-defense?

Now, think back over the killing in the room with those questions in mind. If you, for example, simply rely on a confession and do no investigation, at a later time many of these questions may not be answered, or only answered in a partial way, without the absoluteness that you want in a trial presentation. Think ahead even further: What will the defense rebuttal be? Will the suspect testify? Even outrageous claims by the defense might be "bought" by a judge if you haven't done your work beforehand.

The Mind Set of Investigation

This manual is primarily dedicated to a reasoned approach to investigation. Reasoning and logic based upon verifiable facts form the basis for every sound investigation. Training the analyst/investigator in a methodical approach to investigation is paramount. You must build from solid evidence, just like you would construct a building, through establishing a solid foundation which everything else is built upon using real materials you discover during the investigation to build an earthquake proof (or as close to earthquake proof as you can) structure. If you build solidly nothing can shake the structure apart. You will have your case.

One more factor on the mind set of investigation. Let us lightly touch on *intuition and/or instinct*. We cannot give it an enormous amount of time, and it is certainly not teachable. Much of the time it comes from experience and the unconscious recognition of facts that we are not able to articulate. We simply say, don't dismiss the *feeling* or *hunch*. Follow it as you would any other path. Just don't let it blind you to the facts.

Dealing With the Crime Scene

We are going to assume the following: That the police, both patrol, first response and detectives who specialize in the type of crime which is being investigated have done, and are continuing to do, their jobs. The people who first came upon the scene (perhaps the ones notifying the police) will have been retained for questioning. They first response officers may have been able to (if possible) to determine by their observations, or from what the witnesses at the scene have informed them, who the perpetrator is. Everyone who might have information relative to the crime, both before, during and after, has been

detained for questioning. Appropriate experts or needed assistance may have been called for. Of paramount importance, **officers will have safeguarded the area, sealing it off from unauthorized persons.**

Hopefully, first officers at the scene will remember they are not the investigators. They probably do not have necessary training or expertise, and they will therefore muddy up the scene and, in fact, destroy evidence if they try to "investigate" or generate an analysis of the location. They should not manhandle or move objects, and must not take it as part of their job description that they must search the scene for "clues". If possible, they will separate witnesses so that these individuals cannot "fill in" each other's recollections or, in the worst-case scenario, advise each other on what to say.

If there is a team that is investigating a scene, assignments for each of the analysts should be clear from the start. Obviously, someone must be in charge of the team. He/She gives assignments. It might be wise to have a designated officer notate any person who enters the scene of the crime.

Clearly, there should be someone photographing the location, and the primary pieces of evidence on the site. Remember, one picture is worth a thousand words. And photographic representations do not get lost the way human memory does.

Make a sketch of the scene. Most people are not artists so we recommend using pre-squared graph paper. It is much easier to take measurements, to draw, to place objects in correct relation to each other by using the pre-measured boxes already existing on graph paper. Preserve items by bagging and tagging. Take overall measurements.

Identifying the Scene of the Crime

Remember what you came to the scene of a crime for: You are at the scene to do several things: To determine if a crime has been committed, what crime(s) has been committed, how it was committed, and who committed it. Therefore, that requires a search of the scene: an organized search.

First, what is the crime scene? Example: There is a robbery of a jewelry store by two men. Both carry shotguns. One of the robbers shoots and kills the clerk during the robbery. Both robbers then flee, running outside to a waiting car driven by another man. He starts the car, driving away with only one of the killers able to reach the car before it leaves the location. The other robber is forced to flee on foot. This second robber runs across and down the street, shot at by a pursuing police officer. While trying to escape, one block away, the robber kills a pedestrian who steps into his path. After running another half block the robber is then killed by the officer.

We would label the jewelry store and its immediate environs as the *primary crime scene*. That is the site of the original or first crime scene. We would label the majority of the flight path of the robber and the second killing as the *secondary crime scene.* And the

place where the robbers dump the car used in the getaway? How about the location where the robbers divide the loot up?

What we suggest is that the definition of a crime scene should never create immoveable boundaries. However you wish to label the scene(s) you have to make sure that all locations are labeled with the same identifying name by everyone involved in the investigation. That way there is no subsequent confusion

Crime Scene Procedures

As in every location where ***organized*** activities are conducted there must be effective management of the activities carried on at the location. To do this there must be ongoing communication by all personnel throughout the entire investigation process.

First Responding Officers must secure the scene while making sure that their activities do not, in any way, interfere with the makeup of the scene. When they change factors at the scene of a crime those factors may likely be lost for the rest of the investigation, possibly leading to faulty conclusions about the crime. Aside from the need to aid the victims and apprehending the suspect (if still on the scene) they must *protect the crime scene*. If anything is changed at the scene they must tell the investigators.

The Method of Search

When the crime investigator/analyst arrives at the scene, after an initial walk-through and preliminary review of those events surrounding the crime there must be a systematic search of the area.

There are several methods we must consider:

The Strip Method: Block off the area into square or rectangle. Then go down one edge, looking for evidence. When you reach the other side of the rectangle, simply turn back, .after moving three to four feet to one side and proceed back along the new lane;

Grid Method: Divide the larger crime area into a quadrangle, then into equal quadrangles or squares that are small enough to insure that all of them can or will be covered by an individual easily. When finished with one area go into the next until all relevant areas are searched;

The Zone Method: Individuals are assigned small zones for searching. This is generally combined with other methods. It is used to best effect in houses or buildings. Example: Our jewelry shop (above).

The Spiral Method: Imagine the search area is circular. Start at the center and spiral out, or start at the edge and spiral into the center point;

The Spoke Method: Again, you divide the area into a circular area. Now, one by one, as spokes from the hub of a wheel, go out and search along one of the imaginary spokes to the circumference of the wheel; then, repeat by going from the hub along the next spoke in the wheel.

The method you use may depend upon the terrain involved in the scene of the crime. Use your judgment in the search. Just make sure that the entire area is thoroughly covered. If you miss an area it may be the one area that is vital to your case. Cut chance out of the equation by being methodical.

Replicating the Scene

There is one basic axiom: Memory is faulty. You will forget. Even major factors at a scene will be erased by time. So recordation is absolutely essential. There are a number of ways to do it. Here are some suggestions:

- Take notes at the crime scene. Don't wait until later to make these notes. Include a scene description, conditional information (points of entry, clothing, weapons present, etc.)
- Victim description (lividity, wounds, etc.)
- Crime scene investigators.
- Method of search.
- Location and descriptors of salient evidence.

Always photograph the scene of the crime. Take that number of photographs that will satisfy you that any question that can possibly arise at some later date about the location can be answered. Take photographs from a variety of angles to show all possible aspects of a scene. Take close-ups of important items of evidence. Try not to distort the photograph. And, for goodness sake, take as many photographs of the body, from every conceivable angle, as you can. Some suggestions:

- Photograph the face of the decedent if only for ID and nothing else
- Photograph all wounds in various aspect of focal length
- Photograph any particularly unusual or identifying marks
- Particularities of clothing on the body (i.e. pants pulled down, shirt mis-buttoned, etc)

Put markers denoting measurements in at least a few of the photographs to give scale to the objects being photographed.

Keep notes of the photos to remember what you were photographing and their relative distances from other objects in the scene.

We've briefly talked about sketching the area. Always remember to:

- Take accurate measurements of the scene and illustrate them on the sketch.

- Indicate the directions of the compass on the drawing.
- Try and keep your drawn proportions as accurate as possible.
- Identify the objects in the sketch with letters, numbers or words.
- If you use letters or numbers make sure you have a key (preferably on the page) that identifies what the letters or numbers denote.

Collecting evidence is also an art. You must be careful not to damage, contaminate or destroy it. Example: You pick up a knife. The knife has blood on the blade and blood on the handle. How do you grasp it and place it in a safe container so the blood is preserved…as well as the possible fingerprints on the weapon?

A few things to think about when handling evidence:

- Protect the evidence. That protection may range from protecting it from human interference to natural causes, such as rain, which may destroy the items worth.

- Collection of evidence should be methodical and follow an established pattern of collection. For example, picking up a knife or any possible piece of evidence should be done in a consistent manner, if possible.

- Identify the evidence when it is collected. This can be done as you preserve it (see 4)

- Preserve the evidence, i.e., in a plastic bag; in a tight container to avoid evaporation, etc.

- Transport the evidence in a way that preserves it and protects the chain of custody. Example: Don't leave it laying around before you book it.

- Safeguard the evidence. Make sure it is securely stored in a repository that adequately protects it both from the elements and individuals.

We will return to the field location, either the scene of the crime or search location, later in the manual. However, the following pages are essentially more inclusive and concise checklists of what we have learned above.

Checklists in the Investigation of Homiciedes

The material of this section encompasses the field of preliminary investigation from its first notice. This instruction block will encompass the arrival at the crime scene, the application of appropriate procedures at the scene, the functional direction of the prosecutor assigned to the case and control of the uniformed policemen; the witnesses, and other relevant matters in relationship to the scene.

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INVESTIGATOR'S PROCEDURE

1. When an investigator/prosecutor receives the first notice of the fact that a corpse has been found, or that a homicide has taken place, he/she must take note of the following:

    a) Date and hour of the call
    b) Place where the crime was discovered and telephone number, if available.
    c) How was the notification done? (radio, telephone, personal)
    d) Who notified? (name, number, etc.)
    e) Weather and geographical conditions at the moment
    f) Initial assessment of type of death, age and sex of the deceased

2. Before leaving for the crime scene, if necessary, the investigator/prosecutor in charge should make known to the person who notified, or if possible directly to the policemen present at the crime scene, that they must fulfill the following tasks:

    a) Establish a perimeter at the crime scene in order to preserve the evidence from any contamination.
    b) Initiate a written report of curious people/people at the scene, with complete identification data.
    c) Conduct field interviews with all the witnesses, asking them for personal identification documents.
    d) Initiate immediate capture of the criminal, if know.
    e) Register the location, make, model, color and plate number of vehicles parked in the neighborhood, more or less within 200 meters of the crime scene.
    f) Interview the ambulance crew, register their names an places where they can be located; register any information regarding what they have observed at the crime scene, position of the victim's body, etc., in case the decedent or any other witness or possible suspect has been moved, either at the scene or to a hospital.
    g) As soon as the investigator is notified, he must coordinate with the prosecutor and the coroner so they too can be present at the crime scene to enable them to have immediate knowledge of the facts and to enable them to practice their legal duties and functional direction.

First Formal Duties of the Investigator and the Prosecutor at the Crime Scene

1. Maintain a pertinent information register: When the investigator arrives at the crime scene, he must register the following:
    a) Hour of arrival at the crime scene.
    b) Exact address.
    c) Exterior luminosity conditions, be it artificial or natural.
    d) External weather and temperature conditions.

The investigator in charge of the scene protection must consider:

a) Who was the first person to find the corpse?
b) At what approximate time did the killing occur?
c) Are witnesses and relatives present at that moment?
d) Name of the prosecutor and forensic doctor, as well as laboratory technicians.

Only a few minutes are needed to take **notes**, but those notes are of vital importance for the investigation. It is not uncommon that the investigator has hardly a vague idea of when he was notified with the fact or when he arrived at the crime scene, especially when the trial takes place months or years after. Furthermore, the hour issues are often the first ones to be dealt with in forensic/investigative comparisons. If the investigator is not certain regarding these basic facts of the investigation, his credibility will be reduced.

2. Ask for additional assistance if necessary. Occasionally a homicide can be qualified as an extraordinary case. A case of that type can:

a) Require a wide investigation or technical experience that exceeds the same in a normal case.
b) Create the possibility of large scale journalistic coverage.
c) The victim may be a very important person.
d) Include multiple victims with grave or fatal injuries.

If, in the preliminary investigation, there is the conclusion that a "high profile" crime (i.e. a multiplicity of murders) has occurred consideration must be given to notifying his/her commander and possibly requesting additional assistance.

Using Proper Procedures at the Crime Scene

One of the first things that the investigator must do upon his arrival to the crime scene is to assume supervision of procedures. The preliminary investigation of the crime scene constitutes the most important aspect, and maybe the most delicate, in the investigation of a homicide. One must act with considerable care to preserve the scene. Remember, the smallest details that may appear insignificant can become decisive elements of the case. Furthermore, if the crime scene is not protected, it will affect any subsequent prosecution that will develop.

1. Verify the body (or bodies) of the victim(s) is lifeless.

The body's physical qualities be considered, such as:

a) Temperature of the physical surroundings
b) Temperature of the body
c) Lividity (Livor Mortis). Remember: lividity generally appears after three hours and becomes permanent after 24 hours.
d) Rigidity of death (Rigor Mortis): Corpse rigidity, begins within three hours and is complete after 12 to 15 hours; and disappears after 24 hours.

d) Putrefaction: Organic decomposition by bacteria, begins around 20 to 24 hours.

2.Establish a perimeter.

It is easier to establish a wider perimeter and then reduce it, than to try to widen a crime scene that is too small. The best is to treat every incident where a corps is involved as a criminal homicide…until the facts prove something different. The types of scene must be considered: open, closed, mixed, extended, etc.

a) If the crime scene is found outdoors, in an unoccupied ground, etc., the best way to preserve it is to create a barrier with tape or cord in as wide a zone as is needed to effectively preserve the crime scene. Once the zone is corded, it can be divided in sectors with each sector systematically inspected in search of evidence.

b) If the crime scene is interior, the zone that must be protected beginning at the door or entry road that leads to the structure. All of this zone must be cleared of people and an area barrier created. One must to take special cautions to protect the zone where latent fingerprints or other important elements (foot prints, stains, etc) that shed light on the crime may exist. If something has been changed, it may be is impossible to re-establish its original condition.

3.Establish a line of authority.

a) Public security personnel. The investigator assigned to the case is in command of the homicide crime scene in all its aspects, and he may exclude any person from the scene, except the prosecutor of the case, forensic physician and technical experts. This is applied to other policemen, whatever their hierarchy may be.

- Occasionally, high-ranking police officers can, by inadvertence, destroy valuable evidence at the crime scene. If their presence can lead to evidence destruction, they must be made to understand the importance of protecting the crime scene and requested to keep away from the key areas. The investigator is the one the responsible for that crime scene.
- The investigator must insure adequate presence of uniformed police personnel at the crime scene, to prevent evidence pollution or destruction.
- Weather conditions might require necessary adjustments (i.e., covering certain areas) in order to preserve evidence that could be altered or destroyed.
- The policemen assigned to the protection of the crime scene must be ordered to stay at their posts until they are relieved by authorized personnel.

- A field supervisor may be used to coordinate the investigation activities.
- Coordinate with technical personnel on the processing of the scene.

b) Medical Personnel

A physician or technical paramedics should be authorized to approach to agonizing people. Nevertheless, they should be observed at all times to avoid evidence destruction.

c) Curious Bystanders.

- Be courteous with curious bystanders. That facilitates their collaboration and can persuade a witness to present himself and/or to offer spontaneous information about the crime.

Remember: Any action at a crime scene can destroy or alter valuable evidence. A high degree of vigilance is required to prevent this from happening.

c) Media

Zealous journalists sometimes intend to fulfill their work before the scene is processed. The reasonable thing to do is to let them do their work but only after the technical and investigating personnel have completely finished their processing of the scene.

Basic Processing of the Evidence at the Crime Scene

Recognize the importance of those methods and techniques that lead to the correct processing of evidence at the crime scene. This process will ensure effective subsequent analysis. The most important steps are:

1. Identification of the search location
2. Evidence setting (description of the immediate setting)
3. Compilation (how removed from the setting)
4. Description (identify it, labeling it, tag it etc.)
5. Custody chain
6. Evidence Analysis
7. Conservation
8. Interpretation

Information Recording

The record of personnel activities and the minutes of the field interviews that contain information on the witnesses should generally be completed by the units that may have first arrived to the crime scene. A detailed statement of the observations and activities of

these police officers who initially arrived to the crime scene should be obtained. The Investigator/Prosecutor must center his/her attention on the activities they carried out in the immediate zone of the crime scene; for example, how they entered the zone, the position of the corpse when they arrived, the things they touched or moved, etc. These later become everyone's points of reference,

Accused Arrested at the Scene

a) Even if an accused has already been searched by an officer who was a first arrival at the scene proceed to make a close search of the accused in an attempt, for example, to look for personal objects taken from a victim and/or a means used to commit the crime and/or personal documentation to identify the accused, etc.
b) All constitutional and procedural rights guaranteed to any individual who is arrested must be safeguarded.
c) If a weapon is confiscated from the accused analysis (i.e., ballistics, fingerprints, blood, etc) testing should be requested from the technical laboratories. As well, other relevant available tests on the accused or his clothing should be done as soon as possible. Example: Blood stains on clothes that may be washed out; gunshot residue on the hands or clothing that can be washed away, etc.

Preliminary Analysis of the Scene

Normally, after having processed the crime scene, the analyzing officials at the scene should give their (qualified) opinion on the cause and motive for the killing. They should make a (qualified) reconstruction of the facts to have a concept (qualified) of what happened that helps define boundries for the rest of the investigation. The analyst must openly encourage opinions, but not be unduly influenced by them before completing the investigation.

Dealing with Witnesses, Victims and Curious Bystanders

1. Witness control

a) Establish the identity of all the witnesses found near the crime scene. Separate the witnesses and obtain valid identification for them. Write down their names, dates of birth, address and telephone numbers (both private and employment).
b) All the witnesses must be interviewed individually, even if their testimony is identical. Each statement must be summarized in writing; but avoid voicing your conclusions in the reports, for example: "Witnesses 2, 3 and 4 identified the same person as witness 1".
c) If necessary, have the witness moved to your office location to obtain a formal statement. Notify the officer in charge of transportation to make sure that

witness continues to be separated from the other witnesses after he arrives at the destination.

2. Statement of a dying person

When you arrive at the crime scene and the victim is still alive, but death seems imminent, try to obtain a statement from the victim. This can be invaluable to establish that a crime has or has not been committed, and who, why, what and how it was done. In many cases this statement may be used against a defendant during the trial even though the victim is now dead.

NOTE: If the victim or witness is removed from the crime scene by an ambulance crew an investigator must be assigned to go with the person to try, if not life threatening, to obtain his/her statement or information regarding the crime.

Remember, paying attention to details not only solidifies the case investigation but will assist immeasurably in a court presentation.

Let's examine the sequence of a methodically planned investigation:

1. First notification
2. Coordination with the prosecutor of the case, forensic doctor and scientific/technical assistance.
3. Arrival at the crime scene
4. Establish the perimeter
5. Application of proper procedures of the crime scene
6. Control and use of security at the location.
7. Responsibility of medical personnel
8. Media control
9. Witnesses control
10. Curious bystanders
11. Information recording
12. Preliminary notifications
13. Statements/Information obtained

Taking notes, *in all these areas*, is the basis of any future investigation and prosecution.

Obtaining Additional Evidence

We must fill in the holes of our case. Much of the time the location where a crime such as a homicide has been committed does not hold enough evidence to complete or shore up the sides of the case we are building. All too often an investigator or prosecutor thinks they have enough evidence, so they simply stop looking. That's not the appropriate attitude in building a case. Any case, even those we think as "ironclad" (particularly those we think of as ironclad) can use more evidence. The rule is: an investigation is never

over. Keep on thinking about it; keep on working it. It's only over when the defendant is convicted and sentenced.

Make a list of possible interviewees. Interview them, and than, utilizing what you get from them during their questioning, interview any one else who you find may have relevant evidence. As a rule, interviews should take place as soon as possible after an event. As noted before, all memory is fallible. And the longer you wait to interview the more distorted and the less remembered and unsure the memory will be.

Here are a few simple suggestions on interviews:

- Prepare for the interview. Review all the material you have before you talk to any singular potential witness. You are less likely to make a fool of yourself if you do this. Remember, you want to appear to know more than the witness or they will control the interview.
- Guide the conversation
- Corroborate any witness' statements/information with what you obtain from other witnesses or evidence.
- Keep your questions simple. Keep a positive attitude.
- Be as precise as possible.
- Take into account the person you are interviewing and question them accordingly. For example, a child has to be interviewed with care so suggestions from the interrogator do not lead or suggest answers.
- Most of the time use a direct approach
- Treat victims with care. They have already been victimized.

Have your objectives in mind at all times. You will be trying to find the following:

- The development of additional leads in the investigation
- Evidence of innocence or guilt
- Admissions or confessions from a defendant
- To fill in what you already know from the facts and/or circumstances of the crime.
- To find out if others were involved in the crime
- To develop evidence that leads to any material (i.e. loot) obtained by the criminal as a result of the crime.
- To discover any other crimes which have been committed.

Needless to say, any statements a witness or target of a criminal investigation must be given on a voluntary basis. And, if at all possible, any interrogation should be recorded.

INTERVIEW TECHNIQUES

Most of the time of a crime scene analyst/prosecutor/investigator is dedicated to talking, and then writing about his/her conversations with those people. Most of what is written is a simple annotation of the information received.. Obviously, the best information

about someone is the person itself, and the best way to obtain such information is to ask him/her. So, the clue for a successful questioner is to learn how to effectively collect information by posing questions.

You will have to talk with all types of persons. Most of them will not be criminals. Most of the people with which you talk are victims, witnesses, accusers, informants, relatives, friends, business associates, bystanders, neutral third parties, merchants, house owners, officials, homeless people, men, women and children. In other words, you will talk to all classes of people. Occasionally you will also talk with a suspect.

Of all the aptitudes an investigator needs, the capacity to effectively pose questions is the most important one. It is not easy. Following are some basic techniques that may help you successfully conduct an interview.

Importance

The importance of an effective interview could not be exaggerated. It is the basic instrument of an investigator. According to certain studies, nearly 100% of all crimes are resolved by means of interviews**.** It is important to remember that:

- The interview is the most direct method of obtaining information.
- It is the technique that produces most of the investigations needed information.

Abilities of a Competent Interviewer

Though a wide range of types of personalities can result in good interviewers, the best interviewers have in common certain abilities. They are people with common sense, who are good communicators able to maintain another's attention; they are understanding, and they are persistent.

Interviewers must know the elements of the crime they are investigating, the logical steps they need to take for resolving that crime, including elements of proving a prosecution, and they must know what a criminal investigation is all about, such as taking fingerprints, crime scene assessment, care and preservation of evidence, etc.

A basic knowledge of human psychology is a necessity:

- Each person that is interviewed is a unique individual. Hence, a different approach to that person may be necessary to effectively reach him/her.
- An interviewer must understand the nature of people's motives and emotions such as fear, anger, pleasure, jealousy, etc.
- The effects that sympathy, friendship and kindness have with people.

- The interviewer must have ability to adapt and sell oneself.

Most good interviewers common attributes:

- They always behave courteously
- They are excellent actors. They know how to hide any feeling they might experience and/or express about a crime or the person being interviewed. They also have the ability to adapt their personality to the personality of the person they are interviewing.
- They generally present a friendly image and almost always act as interested, understanding and tolerant persons. However, changes of emotionally display, depending upon the circumstances, may become necessary.
- Interviewers do not let themselves get involved emotionally in the case (although they may present a 'selective' emotion to the person being interviewed).
- Interviewers have to be good listeners
- Interviewers must retain control over the interview. They must not allow themselves to be rushed, manipulated into positions which do not allow for continuing the interview, do not allow themselves to get "run over" or lose sight of what they want from the interview and how to go about getting it.

Conducting interviews is an art, more than a science. Even though there are certain principles that, once applied, increase the probability of conducting a successful interview, the singularity of each person interviewed does not lend itself to a rigid or mechanical approach. Working with people, conducting as many interviews as possible is the best way of become skillful at them.

Warning: There are temptations linked with this type of activity: offers of money or favors, sexual offers, alcohol or drugs, to name the most common. Don't fall into this type of trap. If you do, your career may be over very quickly. It is best to interview a witness with someone else present and/or to have a mechanical device (i.e. a tape recorder) to record the interview.

Reasons Why Information is Given

There are several reasons by which information may not be offered; there are also many reasons to provide information. For example a witness may have a sense of duty, or a desire to be valued, or to protect friends and neighbors, revenge, to alleviate feelings of guilt, etc.

Many delinquents feel a powerful need of speaking about their crimes after they commit them. The spontaneous confessions are very common. In all the cases, you must be on the alert to this possibility. However,
The person that confesses an offense might not have committed. This is a current problem in serious offenses such as homicide. One of the reasons police should never publicize all the facts to a serious offense is to keep pertinent information confidential so it can be used in to eliminate those persons from the suspects list.

Common Types of Interviews

It is important that you have a clear picture of the various types of interviews you will conduct as an investigator.

At the beginning of the interview determine the relationship between the witness and the crime. The witness might be a victim, a passerby who saw nothing, someone who saw everything, or even the suspect.

You must be careful to avoid giving or "feeding" the witness information on the crime. Be on the alert for any intention to deceive you by the witness.

Warnings:

- Establish a positive relationship before you pose questions.

- Many people are reluctant to offer information related to facts on crimes that occur near their home. They may be fearful of getting "involved". For these reasons, and others, be patient in conducting interviews.

- Interviews with people who may have violated the law: Examples: non-licensed sellers, automobile drivers who violate traffic procedures, people that have been involved in accidents, people who have exhibited suspicious behavior and/or people who have committed serious crimes other than the one you are investigating.

Watch the interviewee's attitude and acts during the interview. Again, remember that an objective and calm approach, combined with patience, generally produces a successful interview.

Elements of the Interview

These are basic norms and procedures linked to the art of conducting Interviews:

- Preparation
  - You cannot interview anyone without knowing, at the least, the basic facts of the crime.
- Your Opening Statement on the interview.
  - This sets the tone of the interview. Remember, the witness will form his/her opinion of you in that first contact.
- Establishing Your Relationship With the Witness
  - You must set the emotional tone to the interview.
- Interview
- Reflection Before You Terminate the Interview

- You must assess what the witness has told you. A moment's reflection for both the witness and the interviewer are necessary to flush out the interview. You and/or the witness may have forgotten something which a pause may remind you of

- Culmination
  - The finish of the interview, leaving the interviewee with the mind-set you want.

Remember: The use of force will never supply as much information as correct behavior will. When coercion is *not* used, the information received is more precise. Those questioners who try to obtain information through dominance or authoritarian processes, generally only obtain the strictly necessary information to make a report.

A useful approach is to remember that you have been hired by the society to protect and preserve the life and the property of its people. All people are part of the society, both criminals and non-criminals. If you carry out your activities in a professional way most people will have confidence in you and will help you out if at all possible.

Preparation for the Interview

In many cases there is no specific method to prepare yourself, in depth, for an *initial* or *singular* kind of interview. However even in these cases, you can make basic preparations:

- You need the necessary written material to register the information (in any given moment or condition).

- Use a standard, systematic approach to be sure you pose all the needed standard questions in order to obtain complete answers. For example: Begin simply with "WHAT HAPPENED?"

If you are collecting information on a crime or an incident that is already Into and/or through with its initial phases of investigation, the planning of the interview will need more complete preparation.

You must clearly understand each aspect of the case, which includes:

- The nature of the case, covering those areas of what is known (or believed) has happened
- The date and hour of the event
- The crime scene and the surrounding zone
- The modus operandi
- All the evidence found to that time.
- If possible, all possible suspects and incriminating facts.

When possible, you should conduct a your interviewee with as much

knowledge of that individual's personal background, including:

- Personal history
- Family background
- Physical and mental condition of the individual
- Possible motives. For example: try to recognize money based revenge, jealousy, fear, power and prestige, sex, etc.
- Habits, attitudes, hobbies, pleasures
- Any previous contact with the police. If that person had contact with the police, consider the following:
    - As a suspect (What kind of crime? Was the crime similar to the actual incident?)
    - As an accuser or victim (What were the circumstances? Did a similar situation exist?)
    - As a witness (Did a similar situation exist? Were the people implicated in that incident the same as in this event?)

When planning the interview, determine exactly what you want to know when talking to that person.

- Draft the basic questions you intend to pose
- Determine the best approach to the interview, based on your knowledge of the person
- Choose an alternative approach in case the first approach does not work
- Think about those areas in which the person may be reluctant to answer your questions. Prepare a method to offset that attitude

Plan the best moment for the interview

a) It should be as close to time of the crime as possible (but not before your are prepared)
b) It must be a moment when the person can speak without being disturbed
c) It must be a moment when the person is alone (except for juvenile transgressors and women).

5) You must consider the time and place for the interview.
Remember:
a) It must be in a private place
b) The interviewee will have a psychological advantage if he is on his own ground with a suspect. In the case of a victim or most witnesses, this is probably not important

6) If more than one interviewer is needed, you must determine the roles each one will play during the interview. Who will conduct the interview? Who will take the notes? In what place will each person be seated?

7) You must know what you can do, pursuant to the law, with a witness that does not cooperate. You must know how to be persuasive with this type of persons to get their collaboration.

Opening the Interview

At the beginning of an interview with the victim or the witnesses at the crime scene, you must consider step of your planned process in interviewing. Example: What is the disposition of seats in the room?

- Present your identification. Shake hands, if possible. Give him/her your name. Be courteous.
- Explain the object of the interview. Be simple and direct.
- Begin with questions that the person will not be afraid to answer, such as name, address, job, friends or mutual acquaintances, interests, etc.
- Use a calm voice, proper for a conversation. Don't initially put a person on trial. You are not a judge. It is presumed that everyone speaks the truth; even the one who committed crime is presumed innocent until he/she is proven guilty.
- Do not use terms or words that the person may not understand.
- Take your time. Do not rush!!!

Listening During the Interview

Once you are over with the opening sequence don't talk too much. Remember, you are not the focus of the interview. The witness is.

- Ask the person to detail all the facts, or ask him/her to tell you what he/she knows of the incident in his/her own words.
- If at all possible, do not interrupt.
- Do not pose questions until the person has completed his/her statement.

  This technique:
  - Gives the interviewee the opportunity to tell the truth.
  - Based on clues that you give by posing specific questions a person may change answers. That's not what you want.

  - Increases the possibility that the person will say what he/she believes is most important (and not what he/she thinks you want).

Listen carefully. Avoid thinking of other questions to pose while the interviewee speaks. Wait until he/she is finished before making additional questions. Again, do not rush!

- Pay attention to the pronouns he/she uses. Take note of every change in them and when they are produced (my wife, the wife, etc.).

- Pay attention to the pauses or gaps in the statement. Take note of when they are produced (They may consist of a statement that skips from one place to another, when the modality in previous interviews was to mention each street the car drove over, etc.)

- Try to determine what part of *time* is dedicated to activities before, during and the incident. Pay particular attention to described reactions and sentiments of the people after the incident. There may be false notes that indicate deceit.

Keep silent for a moment or two after the interviewee has completed his/her statement. Use this time to elaborate new questions. This delay sometimes gives the witness enough time to make additions to the statement before you go on, as well as giving you time to consider what the implications are of what the witness has revealed

Interviews (Practical Approaches)

The basic objective of an interview is always the same: to obtain information. We've talked about this before, and it is worth repeating: These are the basics you are trying to get information on.

- What? What does the crime or incident consist of?
- When? When did it happen?
- Where? Where did it happen?
- Why? Why did it happen?
- Who? Who made it happen?
- How? How did it happen?

Let us examine each one with more attention. Sometimes our answer to these questions is more difficult than it seems at first sight.

What does the crime consist of?

- Was there a crime committed? If so, which? What are its elements? Are all of them present? Do you have information on each one? Who is the accuser? What is his/her relation with the victim? Who were the victims? What is the magnitude of the damage or injuries? Is it possible to verify? Who saw what occurred?

Answers that you get should, almost invariably give rise to other questions. For example:

- What types of physical evidence will this kind of offense leave? In that case, is there any? Will it be necessary to preserve it in some special way? Are additional. If some stolen good was assured, did

the insurance exceed the value of the goods? Are there other tests necessary? Are there other witnesses I need to interview?

When did it happen?

- When did the criminal activity start? How long did it last? When was it over? Does it still continue? Is there a conspiracy to conceal facts?
- The answers to those questions will raise additional questions. Was something else going on at the same time? Are other facts related to the crime?

Where did it happen?

- Where did it start? Where did each part of the crime happen? Where did it end? How did the criminal act move from one place to the other? What is the reason for this movement? What happened during the movement? Are the first and the last part of the crime mutually related or were they independent facts? Will it be necessary to preserve the crime scene(s) other than how we have already preserved it?

The answers will bring other questions to mind

- Was there really more than one crime against the same victim? Is there more than one suspect in the crime? If the crime affects various places and suspects, are the elements of the crime still intact with respect to some of the suspects?

Why did it happen?

- Was the crime or the incident intentional? Which was the motive? Did the victim contribute to the incident? Were there strong emotions manifested? Was the victim the one intended to be harmed? Who will get the benefit out of this crime?

The answers to these questions may raise more questions.

- From the criminal's point of view, was the crime successful? Was the crime planned or was it really the result of facts that ran out of human control?

Who made it happen?

- Was there a particular person who made it happen? More than one? Did they arrive there with that purpose? Was there any

relationship between the victim and the one(s) who made it happen? Did the suspect bring something with him that helped him commit this crime?

This question may raise additional questions:

- How long did the relationship between the suspect and the victim lasted? Did something recently occur to change the relationship? If the suspect brought something with him to help him commit the crime, where is it?

How did it happen?

- What was the first event that occurred leading to the actual commission of the crime? What was the sequence of facts? Was it a a *strange* or *bizarre* sequence? Was the sequence intentional? What altered the sequence? What instruments at what force (speed, etc.) would be required to achieve that sequence of facts? Did the suspect have the capacity to the things that are required? Does he (do they) still possesses them? If not, who has them? What was the last that happened?

Other questions may result from the answers to the previous question.

- Why was it committed in that sequence? What are other possible sequences? Does this fit with everything else? Is there another way of acting that raises the same test and causes identical result? Could someone else have done it and made it seem this way?

These Techniques Should be Considered:

Pose all the questions in an open format. Examples:

Interviewee: Where do you want me to start?

- Investigator: "Start at the beginning", or
- Investigator: "It is not too clear to me what happened. You arrived at the place and –?" or,
- Investigator: "Then you crossed the street and –?" or,
- Investigator: "- You said you left the building and then –?"

- Treat everyone with understanding. Make sure you are interested in their well-being. Flattery always gives good results. Reach for their "responsive" emotional level. Example: You show

comprehension and compassion as to why the person could have committed the crime.

- Always consider non verbal communications (for example, visual contact, nervousness, head position, hands, legs, emotion, behaviour changes).

- Always begin with non intimidating questions.

- If you want to pose additional questions over a certain part of the statement, ask the person to repeat his statement once again, beginning at a point *prior* to your field of interest. Always let the interviewee use his own words.

- "Do not put words on a person's mouth".

- Never ask a suggestive question. Do not say: "It was you, wasn't it?"

- At a certain point, always ask the person if he has committed the crime. Remember that people are less inclined to confess a crime if they are given the opportunity to deny their culpability several times. Do not ask the question before the appropriate moment. Be on the alert to detect signals that show that the interviewee's resolution is weakening (for example: sighs, bowed head, tremulous voice, lowering or breaking of eye contact, looks fixedly to the ceiling or out of the window, or comments which reflect a disposition to confess.

  Pose the question directly, without emotion or resentment. Show yourself firm but compassionate. Make a claim on his conscience, to his remorse or to his feeling of confusion or frustration. Once the person starts confession, make him continue speaking, making sure that all the issues are treated.

- One important thing to remember is that, as an interviewer, you cannot offer the interviewee too much information (on the case, personal or even irrelevant).

Conducting interviews with women and children

- Always have two investigators conducting the interview.

- Always be polite to women, whatever their identity or profession.

- While investigating a crime with sexual connotations, it is better to have a female investigator conduct the interview.

- Children do not think, act or react as adults. They are more inclined to be direct and truthful.

- Children have a private life as equally important to them as to adults. Avoid public interrogation. Moreover, in many cases, police regulations demand that a parent or a tutor is present.

- If a child does not collaborate or is extremely frightened, do not try to interview him without his parent's presence.

Special circumstances for which you must be prepared:

- Interviews of physically handicapped people (for example blind, deaf, dumb) or people who do not speak your language.

Reflection During the Interview

Before ending the interview, give yourself time to analyze the information given by the interviewees, scan your own notes, organize and analyze your information and thoughts, and give sense to what you have verified. This will raise new questions.

If it is necessary, ask the interviewee to excuse you for a couple of minutes to be able to finish this task. Do not hurry.. It is very important you obtain as much precise information as you can from the interviewee. You must always suppose that you will only have one opportunity to interview this person.

Be careful to detect contradictions in the interviewee's statement, or other indications that he is lying. Ask him to repeat the part that you want to make clearer, or ask the question using a different choice of words if you wish him to confirm a previous answer, give new information or perhaps contradict information previously given

Ending the Interview

Always finish the interview in a friendly way. It is important to:

- Read the interviewee the information he has supplied so he can make changes or additions to his testimony.

- Ask him to sign the copy of the report you have just read. Be ready to explain why you ask him to sign the statement. If he hesitates or refuses to do so, that might indicate that his statement is bogus in some aspect.

- Always give the interviewee a last chance to add more information.

- Once you are sure the interviewee has nothing more to declare, give him your name and telephone number where he can contact you in the event that he remembers more details later on.

- After thanking him for his time and collaboration, on his way out, consider the possibility of asking a key question (Now is not the time to ask if he committed the crime). In that moment, he will have dropped his guard and be more inclined to answer without giving it much thought.

Since this is homicide investigation manual based on site investigation we will leave other criminal investigations for the moment.

As discussed previously, to establish that a murder has taken place we must prove a person (1) has died (2) from criminal means. The identity of the murderer is not part of proving the crime has been committed. However, if we cannot prove that a singular person or persons have committed the crime we have no case we can take to court. Therefore, although some of the time the cause of death of an individual (or even that a person has died, such as in a missing persons case) may present problems of proof most of the time an investigation centers on proving the identity of the murderer.

In some cases identity of the decedent is difficult (or even impossible) to prove. This brings us to the requirement of working with experts at every stage of the investigation. Any investigator can become an expert in certain areas. However, long training is required in other aspects of forensics that require identifying those individuals who must be brought into a case early on to create the team necessary to accomplish an effective approach to truly completing a professional investigation.

For example, an individual may be murdered in such a way that that the facial characteristics have been obliterated. The body is found in a remote spot in the desert. There are no identification papers on the body. But the hands are intact. Do we have a fingerprint expert working with us? Or a dentist to identify bridgework? Or a serologist to type blood? Or the most basic of experts, a physician qualified to do an autopsy, a pathologist who can not only determine the cause of death with certainty but can find other identifying characteristics on or in the body to create enough landmarks to identify the decedent. Old fractures? Blood groupings? Hair and fiber evidence. How old is the individual? A pathologist can give us a rough estimate, particularly of an individual below the age of twenty-five. Are there defense wounds on the hands or arms of the individual?

When did the victim die? There are a number of factors that can establish these facts with even some minimal expertise: (a) temperature and rate of cooling (b) post-mortem lividity (c) rigor mortis (d) putrefaction. Was it a murder or suicide? Were there

alterations to the body position after death? We can determine these facts. But, again, a level of expertise is required.

Clothing has what we believe is gunshot residue. Can we establish what it is? Do we have an expert in gun-shot residue who can establish how close the muzzle of the gun was to the decedent when the shot was fired?

Ballistics and firearms analysis, trace and chemical analysis, blood alcohol and drug tests, DNA comparisons, documentary evidence, Latent fingerprints, hair and fiber analysis, casting and molding techniques, tire tread comparisons, handwriting comparisons, all are fields of expertise and contribute to investigation and building the case. But they require demonstrated expertise, individual credentials that enable that individual to testify as an expert in court to the subject matter that is outside the ordinary and should not, ordinarily, be taken notice of by the judge without establishing the expertise of that witness.

To see how to utilize these *experts*, as well as the ordinary experience of the investigator, let us examine the concept of scene reconstruction more thoroughly. Even more so, let us examine the crime scene and its investigation with only the minimal amount of expertise provided by outside experts.

The Crime Scene: A Brief View and Review

A. Evaluation comes *before* the theory, not after.
B. The correlation of multiple areas of expertise
    1. Autopsy Protocol
    2. Crime scene investigation
    3. Serological Analysis
    4. Bloodstain pattern analysis
    5. Firearms Analysis
    6. Other
        a. Trace Evidence Analysis
        b. Gunshot residue
        c. Fingerprint processing
        d. Pattern Evidence (shoeprints, tire tracks)
C. Common questions that analysis and reconstruction may answer
    1. Where was the victim when the attack occurred?
    2. Where was the suspect positioned during the attack?
D. Is the amount of blood or the blood patterns on the suspect's clothing consistent with the severity of the attack?
E. How many blows were struck and are the patterns consistent with the wounding detailed in the autopsy report?
F. Was there significant movement through the crime scene by either the victim or the suspect during the attack?
G. Are the suspect's statements consistent with the evidence?
H. Are the victims' or witness's statements of the events consistent with the evidence?

I. Were there any attempts by the suspect to clean up or alter the evidence?
J. Is it a homicide or a suicide?
J. Is the witness a suspect?

Gathering the Data/Evidence

The prosecutor and the investigators must both ask the questions, even if one has come late to the scene or has not been able to analyze the scene itself. Do not assume someone else has done all the work that needs to be done.

- The process begins with the questions. All appropriate data must be gathered, including measurements, photographs at the scene, field investigation reports, etc.
- The expert may formulate conclusions based on the analysis of the conclusions of other experts but if this is done it should be indicated in any report or testimony.
- There must be an evidence list with evidence locations and all relevant statements.
- First officer reports should be completed and examined
- All analytical reports must be completed.
- The expert makes detailed notes and observations with the
    a) Relevant questions in mind; and,
    b) Asking,: Are there additional questions that may arise from the evaluation of the evidence?
- The expert formulates an opinion (if one is rendered)
- The expert issues a report (at this point a meeting with the prosecutor is strongly recommended if the two have not been working together.
- The Prosecutor, the investigator and any experts prepare for testimony in court.
- Make sure that the experts CV is in the report or will come before the judge during testimony. The expert should prepare a CV illustrating training and experience. This training and experience must relate to the matter for which the expert's testimony is being introduced.
- The expert should have a conclusion supported by all the data and not contrary to any of the evidence. If there is some disagreement among the experts this may be stated along with relevant reasoning.
- The expert may state an opinion based on another experts conclusions but must state this in his reports or testimony.

Reconstructing the Scene: A Warning

Crime scene reconstruction is what every prosecutor, analyst and investigator attempts to do. However, there are some crime scenes that lend themselves to "rebuilding" more than others:

- Homicides where the defense is claiming self-defense
- Stabbings or Beatings
- Murder-Suicides
- Any case where the suspect makes statements
- Cases where the suspect was injured or bled
- Cases in which the crime scene is well contained (i.e. inside a garage, a vehicle, etc.)

Some crime scenes are not well suited for Reconstruction.

- Cases with minimal contact between the victim(s) and suspects.
- Cases which involve many shots fired and many injuries.
- Cases where there are minimal or poor photographs and minimal evidence collected.

Evidence and the Crime Scene

The properly trained crime scene investigator or prosecutor may well develop details that no witness can ever remember or any lab test ever reveal.

The ability of the prosecutor and investigator to observe evidence in its position at the scene, relative to every other item, provides a unique opportunity to maximize any deductions that can be drawn from it. However, the prosecutor and investigator must be aware of the effects of time and scene conditions that directly impact the conclusions that can be reached from evidence:

This section is for the purpose of clarifying previously discussed concepts, provide examples and discuss different ways of applying these tools in an investigation. Among them is the ability to observe details and then apply those details to ways of thinking, such as trying to find an error in your own opinion or pattern recognitions (i.e. a case encountered before). Though some of these concepts may seem strange they are not complex and should be recognized as simple processes that will aid you in any analysis.

Effects of Time and Surroundings

It is essential that the scene analyst realizes that the interpretative value of evidence is enhanced by the time and place in which the item was found. It is imperative, therefore, that the totality of the scene conveyed by the evidence is observed, recorded by the crime scene analyst and finally preserved for the benefit of the investigation team and the prosecutor.

The effects of time and surroundings can manifest themselves in many ways at the crime scene. Among the possibilities are:

- Predictable effects
- Unpredictable effects and events
- Transitory evidence
- Relational details
- Functional details

Let's examine these possibilities.

Predictable Effects:

Predictable effects often provide valuable information regarding the actual time of the incident. These observations are based upon naturally occurring alterations that take place in an object. It is up to the analyst at the scene to record key details that are essential to preserve this type of information. The analyst, through experience and training, develops awareness and an interpretive "eye" for the results of predictable effects of time and surroundings.

For example: Body changes aid in the estimation of the time of death or the degree of settling in the soil above a grave site are forms of predictable changes which are, in themselves, evidence. They must be recorded and/or photographed to preserve their qualities. Other examples: the melting of ice, drying of wet footprints or the development of lividity, or rigor within a body. All convey clues but must rely upon evaluation at the crime scene

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Effects of Time and Surroundings: Unpredictable Effects.

Unpredictable effects in evidence can often be disastrous unless the original condition of the item is noted and then carefully documented. Full and accurate documentation of the evidence at the scene should minimize the impact of unexpected and unpredictable changes that might occur and give false leads/information to the investigative effort. Many of these "unpredictable effects" are the result of the "transitions" which occur during an investigation from the "first officer response" to the "medical attendants", and ultimately to the person documenting and collecting the evidence at the crime scene.

For example: Opening a revolver's cylinder without noting the relative position of the chambers and hammer might change a suicide to a homicide; inadvertent addition of bloodstain evidence to unstained clothing might render them useless for analysis/investigation purposes. Unpredictable effects might even be a result of life support efforts by medical personnel unconcerned about solving the case.

Transitory Evidence

Transitory evidence, or things very temporary in nature, must be detected at the scene or be lost forever to the investigation. This may be by virtue of the nature of the object, or by the effects of the environment in which the evidence resides.

For example: Odors, temperatures, initial observations of tracks, fragile imprints in moisture, or even something as simple as a smoldering cigarette butt are transitory in nature. Though the cigarette may be collected, the observation that it was still burning will be lost forever unless seen and noted by the investigator.

Even the frost on a windshield of an accident vehicle may be lost as the sunshine warms the glass. This is transitory evidence because of the effect of the environment.

Effects of Time and Surroundings: Relational Information

Relational information is derived by virtue of the interdependence of one item of evidence with respect to another. Information critical to a reconstruction can be derived from these observations. Most of these clues must be "collected" in the form of documentation of one item's position in relation to another. Evaluation of the evidence in its environment is essential to successfully recognizing these clues from the crime scene.

For example: Cartridge casings scattered at a homicide may help establish the position of the weapon within the area, or establish the path of movement of a suspect firing a weapon within the crime scene. The real evidence value for interpretation may not be in what these items are, but rather where they are.

Functional Information

The condition of an item of evidence must be documented at the crime scene prior to the item's collection or packaging. These details will probably be lost forever unless observed at the crime scene. The analyst should think of how an object of evidence works or operates in order to fully collect all the information he/she can from these items.

For example: A coffee pot which is on; a weapon which is cocked; an alarm clock set for a certain time, with the alarm wound down. Each of these can offer more information than just their identities, and may well provide keys to setting the activities of the victims, the time of the crime and the duration of the incident.

Observations and on-site evaluation of these types of evidence provide the details necessary for an analysis which progresses beyond "who did it" into the "how it was done" or perhaps even "why" the crime was committed.

Concepts of Evidence: A General Definition of Evidence

The ability to recognize evidence and apply it to the analysis of a particular event can be developed further if the elementary definition of evidence as "anything out of the ordinary" is broadened. Just as accurate is the definition that evidence is anything which is added to the scene, is missing, moved, or removed entirely from the scene or which contributes information to the who, how, when, where and why of a crime.

Generally, evidence is anything that supports or refutes a possible analysis of the participants and their activities in a crime.

For example: The victim's shoe kept by the suspect of a rape; or a kitchen knife missing from its rack are missing items which contribute to the 'how' and perhaps 'why' of a case. An accumulation of newspapers on a porch or rigor mortis of a body helps to establish when an event occurred. Sand in the mouth of a deceased victim found buried in a rocky area may help locate the 'where' of the original crime scene.

Concepts of Evidence

These definitions encompass a broad range of information which, as recorded or collected, become evidence. There is a specific range of conclusions that can be reached by properly using the above tools of observation. The conclusions that might be reached include the following concepts:

- A sequence of events.
- The direction of events important to the substance/character of the crime
- Description of actions or positions.
- Identify ownership or origin.
- Limit the scene.
- Allow for the formation of an opinion.

Examples:

Familiarity with the variety of items that fall in each event can assist the analyst in the recognition of what is and is not evidence. Some simple examples help illustrate this point.

- Sequence of events evidence: Anything that can establish the order of events relative to the crime.

  For example: Multiple bullet holes in glass, a drop of blood on a soiled shoe track, or blood under a broken piece of window glass all have components for which an order of deposition can be determined.

- Directional evidence: That component of an item that will aid in determining the path or motion of an object or participant at the scene.

  For example: Blood spots, the shape of a bullet hole in glass, skid marks versus acceleration, and ricochet patterns.

- Position or Action: Factors which provide information to reveal the motion or the actions of the parties involved may also serve as an indication of the relative positions of each of the participants.

- For example: Overall blood patterns, the position of casings and shot shells ejected at a scene, or the orientation of tool marks.

- Ownership or Origin: Items of evidence which establish the origin of an object or identify persons. They provide information that can reduce the list of possible origins or participants.

  For example: Fingerprints, shoeprints, tool marks, and physical matches of broken or torn edges.

- Limiting the Scene: This includes those vital references which restrict the boundaries of the search, but which must remain flexible enough to be modified as new information arises. It is important that analysts not allow initial case impressions to prejudice a determination of the limit of the scene, but, rather, let the initial walk-through and later observations define the scene perimeter.

  Example: The presence or absence of blood, bodies, weapons, turmoil, or any tracks are elements that limit the scene. Directional or positional evidence, which leads in or out of the immediate scene area, also serves to limit the scene perimeter and leads to additional scenes for examination; e.g., the hole in a window at a homicide will probably lead to a second scene: the location of the marksman.

- Infer derived information: This comes from the experience of the analyst and the powers of observation. Most of the information in this area is a result of pattern recognition on the part of the investigator. Subtle inconsistencies with previously encountered patterns of behavior or effects of time and surroundings will lead the investigator to derive certain facts and through the powers of deduction, arrive at conclusions.

  Example: A break in the misted bloodstain on the wall, in front of a shot-gunned victim will lead to the inferences that (1) the position of the shooter was at a particular point; (2) there should be blood of the victim on the suspect's clothing because the range of the shot was very close. To the experienced investigator, these series of inferences occur within seconds of the initial observation of the scene.

Caution should be exercised, as inferred details must be corroborated by complete documentation of the items that supports the conclusion. Often this documentation includes the relationships between items, their position in the crime scene and details as to when, in the course of the crime, these items were deposited. Photographs and sketches are very important to support inferences drawn from evidence at the scene

What Is Evidence?

Evidence is anything that supports or refutes the analyst's concept of an event. It can be an object or its state of operation, a time or spatial relationship between objects and/or people, the origin of an object, the motion of a participant or object or a concept inferred from general observations.

The legal definition of evidence does not specifically include these detailed "event concepts" or the "effects of time and surroundings" for which the scene investigator should be ever watchful. However, these concepts will aid the crime scene analyst's efforts to locate all the evidence within the crime scene and to better understand the frailties of each clue. Only through careful evaluation of the scene and the relationships of the objects within it will the full meaning of any object's value as evidence be detected and the actions of the crime be reconstructed. The analyst should master these concepts and build upon a sound awareness of what can be revealed through laboratory analysis.

Everything is evidence of some event. The key is to identify and then capture evidence relative to the incident that is in question. Often, it is the information developed through the investigator's powers of observation that separate evidence of the current crime from the residuals or processes of prior activities.

For example, bruising on a body contains information such as: the body position at the time the bruising occurred, how long it has been on the body and the type of force used to create it. Keen observation skills will be needed to note these factors and relate them to the crime at hand. Another example is the accumulation of pry marks on a commercial business doorjamb. The analyst must carefully note which show signs of age and which seem fresh. It is the more recent mark upon which attention will be focused.

Where to Start

First Impressions:

In the course of investigating a crime and then analyzing the activities comprising it, an analyst usually begins with an overview of the crime as it has been related to him. This builds an image of the crime based upon, for example, the statements of witnesses, and assumptions made by "trusted others" at the scene. Though none of these "clues" by themselves form a reasonable foundation for accepting the "initial impression" as accurate, all too often it is this impression that forms the basis of the case investigation. It is critical that the crime scene analyst realizes that, at this point of the process, over-reliance on this type of information may actually hinder an investigation.

Though instinct and experience can create first class investigators, the best analysts are always wary of the possibility of a wrong "first impression" and use their developed powers of observation to re-verify opinions. It is impossible to recognize evidence unless the investigator has an initial theory of what occurred. This leads to a mental "role

playing" as to how the crime might have occurred, which in turn leads to additional evidence which supports or refutes that theory.

If evidence contradicts the theory or raises new questions, the analyst must alter the analysis to incorporate all the evidence and clues. The analysis that evolves in this fashion will locate then incorporate all evidence and provide substantiated details of how the crime occurred. Remember: it is better to use this process of internal questioning at the crime scene rather than in the courtroom**.**

Problems in analyzing the crime scene arise from the analyst's inability to see beyond a first impression. The successful analysts rely on experience and these images primarily to pinpoint key elements. These key points, like a "Y" in the road, lead to several possible answers to a problem. By using experience, instinct and developed powers of observation and thinking, choices are made by the analyst as to which path of logic to take. Ultimately, the accumulation of many such logical decisions refutes the dozens of other possible theories and leads to the correct solution.

An Analytical Technique

Possibilities

It would then be rather wonderfully simple to identify which elements are actually present and then select the analysis which simply had the highest number of links to the case at hand. However, all of this depends on the mind's ability to break the limitations of preconceived notions and fully explore all possible analysis.

Logic Path (Storyboard)

In Hollywood films one way they know what they are going to put on film is to do a "storyboard". They use a pin-board to tack up sequential drawings or diagrams that are tacked up in a time-line, one after the other until the conclusion at the end of their projected film. However, we are not creating an act of fiction. We are creating a "fact" or "logic path" with our storyboard. In essence, we are "boarding" a documentary of a murder analysis. Our way of achieving that open style of logical thinking is to list the components of a crime and build a kind of the correct "story board" leading to the case solution. This storyboard is just a series of logical points that lead us to our conclusion.

The key components of a crime are used to chart points that form the theorized "storyboard" of the reconstruction. Each of these key components is supported by a number of possible explanations. It is critical that the analyst considers all the explanations. Each possible explanation must be logically evaluated. We then can eliminate one, or several, after proof has been found which refutes it. That proof may be a result of on-scene evidence evaluation or the laboratory analysis of evidence. In either instance, the proof must be documented to refresh the analyst's recollection at a later date.

The explanation selected will lead the analyst to follow one path or another as a theory is developed and the "storyboard" evolves. If the reasoning pathway suddenly hits a contradiction, the analyst should back up to the last series of decisions and re-evaluate the possibilities. An alternative may have been overlooked or eliminated without adequate proof, or because of "glitches" in the analyst's logic. It is often helpful to discuss alternatives with a co-analyst in a form of breakdown of the facts that considers every possibility, no matter how trivial or absurd it might sound.

A Technique of Reconstructing Crime Components

To help the analyst locate decisive points in a case analysis, it is suggested that the following major components of the crime be determined.

1) Identify Major elements of the Crime Scene and the Victim Profile

The legal definition of the crime establishes several major components that must be satisfied to present a case to court. These elements can serve as a starting point in the search for evidence. The analyst must know the penal code, and search for the evidence which fulfills the code definition. Consider the age, sex, infirmities of the victim, location of the crime scene (remote, public view, concealment), the perpetrator's activities leading up to the criminal act, etc.

2) Find the Motive of the Crime

Was the crime for monetary gain, sexual gratification, revenge, hatred, religious anger, random, etc.? Did the crime serve as a cover for another offense? What was the relationship of the victim to the perpetrator? What is the time frame for the totality of the crime? What was the location and what were the actions of the perpetrator and the victim at the time of initial contact?

3) Determine the Tools or Weapons Used

Consider the type of weapon used and the likelihood of its ability to associate the suspect with the crime. Included with the usual objects, such as knives bludgeons, firearms, ligatures, etc. should be the extent of force used, the degree of control used by the perpetrator upon the victim (e.g., bindings) and, in an assault, whether the weapon required the assailant to closely approach the victim or remain at some distance and be anonymous (using a knife as opposed to a gun, or beating a victim with fists as opposed to planting a bomb).

4) Establish the Positions, Movements and Actions of the Victim and Suspect

Is it likely that the perpetrator lay in wait, knew the activities and schedule of the victim, or had other knowledge of the victim that implied a familiarity with the victim? Does evidence at the scene or circumstances of the crime provide any information about characteristics of the perpetrator (height, strength, habits, skills or occupation)? Was the contact between the perpetrator and the victim prolonged in duration or rapid in sequence and concluded quickly; for example, a prolonged attack leaving trails of blood over an entire residence as opposed to a single fatal gunshot wound.

5) Was Anything Taken From the Scene by the Perpetrator? Was Anything Left Behind Belonging to the Perpetrator?

Other than as an implication as to motive (financial gain from a burglary), things taken from or left at the scene can provide identifying information that may be tantamount to an admission of guilt. In this category are the suspect's footprints, fingerprints, the firearm compared to the bullet, tool-marks versus the tool, genetic factors and the like. Though these, in themselves, may prove to be great evidence in court, their relationship may well provide details leading to the reconstruction of the events preceding and activities during the crime.

The officer should search for evidence that will determine the method of escape as well as entry. A vehicle left at a location, a change of clothing or a weapon brought to the scene, all indicate a state of preparedness that will help identify the possible perpetrator and the degree and severity of the crime. This information can prove valuable during the sentencing phase of a trial as well.

6) Seek Every Alternative to the Most Obvious Analysis, Even If It Seems Implausible

Once the first five areas have been thoroughly probed, it is time for the criminalist to search for any, and all, possible reconstructions as to how the crime occurred. Statements by a surviving victim, eyewitnesses, or from the suspect; inferences drawn from evidence at the scene; or a pattern of one case which seems to match a previously encountered one, can all contribute to this list of possible reconstruction. Don't dismiss any of them as solutions to the analysis until they have been proven by the evidence to be impossible.

Remember: the analyst of the crime will find it helpful to consider the perpetrator's initial approach, method of victim control, mechanism of attack, motive of the criminal, duration of the event, and likely method of escape. These may lead to evidence not otherwise obvious.

Crime Storyboard

When these areas have been completed, the investigator may create an outline or "storyboard" of the actions of the perpetrator and the victim of the crime. To help visualize the theory, the investigator creates the storyboard by assuming the roles of the

victim and perpetrator as the crime is mentally acted out. This story board includes the conjectured description of the perpetrator; point and time of victim contact, type of weapon or tool; degree of force; duration of the crime; extent of the crime scene and mobility of the perpetrator; the actions of the perpetrator to shed himself of the crime (disposal of the body, pawning of the loot, washing off the blood or throwing out stained clothing) and a list of objects either taken from or left by the perpetrator at the scene. Within this storyboard, secondary factors supportive of the reconstruction will be implied. These small details are then investigated to either negate or support the theory of that reconstruction. Nothing can be more satisfying to the analyst than to have the storyboard predict evidence, and then find it was there all along, but simply overlooked.

A Technique of Reconstructing Implied Details

Within a reconstructive analysis are many implied small details that serve to clarify the actions and movements of the victim and the perpetrator, and "round out" the solution. For each of those details, the analyst should juxtapose the possibilities with the facts of the evidence, searching for that which establishes position, action, sequence, or origin. The analyst may find it helpful to diagram the process to better see the steps unfold. The storyboard or theory must be altered to absorb these details that conflict with the original theory. Eventually, the correct reconstruction will surface and all details will fit.

A Review:

For any crime, there are a finite number of reconstruction theories. Once the analyst has listed the major components of the crime, built a "story board" and logically considered all of the alternatives, the best pathway to the "picture" of the crime will be identified. It is then that the small details of the evidence are identified by creating the more detailed storyboard. The analyst then verifies details by whatever means possible. The overall reconstruction is thus validated.

The analyst who remains alert to contradictions within the theorized reconstruction will detect the evidence that challenges the theory. He should then modify the reconstruction storyboard in recognition of new evidence which doesn't fit the old theory but will fit the new one. Such an ongoing process will ultimately formulate a solid court presentation**.**

What remains, after logically arguing even remote possibilities, will be the best-supported analysis. It must be stressed here that the analyst must consider even remote possibilities and argue their case to himself or a case partner, if this method is to prove successful. Questions asked at the crime scene and successfully answered within the reconstruction of events will be routine when encountered in court. Imagine the alternative: when the question is encountered in court for the first time and the analysis hasn't previously addressed it!

A case example of this process may help explain the major elements of our "storyboard" and our deductive reasoning process.

The "Motion Picture" Scenario

The body of a middle-aged female is found in the living room of her suburban home. She is lying on her back with her arms at her sides. Dressed only in a nightgown she has blood on her face, which streams from her nose and mouth. There is an apparent bullet hole in her right temple and a small caliber handgun near her right hand. The nightgown is stretched tightly from her buttocks to her shoulders. Blood smears coat her right hand that also has a dark sooty deposit in the palm. The decedent was last seen the night before, at a local restaurant, in the company of her sister. The victim had been somewhat despondent, but by the end of the evening had improved in spirits. The ten-year old market delivery boy who came to collect for food he had previously delivered found her. The front door was open and she was plainly visible through the doorway.

The analyst may have the preconception that the "smoking gun" and damage to the head point to a suicide. This first impression, though a starting point must be set aside if any evidence exists at the scene to refute that theory. The analyst may obviously set aside the "natural death" scenario; however, the possibilities of ACCIDENT, SUICIDE or HOMICIDE remain.

Components

Major Elements of the Scene and the Victim Profile:

- The critical elements include a dead body, a bullet hole in the right temple, blood on the hand, possible gunpowder residue in the body's right palm and the victim's position on her back Her state of mind and the open front door will enter our "story board" which evolves in this case. The scene is limited to her home, which shows no sign of forced entry.

Possible Motive of the Crime: Immediate Factors to Consider

- If this is a suicide, the state of mind will play a key role, as does the functional condition of the weapon and the extent of damage to the victim.

- If this is an accidental shooting, motive does not apply; however, the weapon may be defective, or there may be only a single cartridge casing in the revolver, as in Russian roulette.

- If this is a homicide, what would be the reason to kill? The victim shows no outward signs of rape or struggle; there was no burglary, and the weapon was hers.

- Tools or weapons used need to be considered: The weapon that appears to have inflicted the damage is the small caliber handgun. No signs of struggle are visible nor was there any sign of rape.

- Motions or positions of the participants: There was no forced entry into the home and no sign of struggle. The bloodstains on the victim‘s face imply that death was not immediate. The condition of the victim’s clothing should be mentally compared to how a suicide victim would react versus a homicide victim. How did the garment get stretched from the buttocks to the shoulders?

- ltems that were taken and/or left at the scene: Nothing was reportedly removed from the scene. Nothing seemed to have been left behind at the scene.

- If this is suicide, an expended round should be under the hammer, and the number of expended casings would likely equal the number of bullets.

- If this is accidental powder residues around the wound may be essential to estimate distances. For example, if the gun accidentally went off during a straggle with another person.

- If this was a homicide covered by the appearance of a suicide then the functional condition of the weapon, the clothing of the victim and the locations of the blood and powder residues may conflict.

Using Logic

Let’s select one of the possible reconstructions and generate decision points from the listed major elements of the crime. These are as follows:

Accidental death: If the firearm discharged accidentally while in contact with another person, the angle through the head would be important, and we would expect a life sustaining efforts of some sort. Close examination shows no first aid, and TWO nearly overlapping bullet holes.

Suicide: Two bullet holes are possible in a suicide but the condition of the garment is not consistent. How does a person, simply falling after being shot, “squirm” on the floor, pushing with her legs and sliding on her back thereby stretching the nightgown? Particularly since the throw rug under her feet was neatly in place on the hardwood floor?
.
Homicide: The bullet holes are consistent with homicide, but why is the gun near the hand and the powder residue in her palm?

Creating the Storyboard

Creating a storyboard of our observations reveals further details that needed to be investigated. Among these details should be: evidence to support movement of the victim ‘s body, such as blood trails on her face; two bullets in the victim‘s head to correspond to the external damage to the temple, expended casings in the correct chamber positions of the revolver and blood on the gun from the victim’s right hand. It is the analysts’s burden to seek out these clues and modify the theory and storyboard to adapt to the evidence found. In so doing, the analyst would begin to focus upon the homicide theory, with the overtones of suicide as a concealment of the crime.

As a further result of additional efforts at the scene it would be discovered that the weapon had two expended casings in the wrong rotational positions relative to the hammer AND the discharge halos do not correspond to the expended casings.

Something Left Behind

The perpetrator had left behind something at the scene. A damaging clue was laced into the concealment of the crime! Of all possible suspects, who would want to hide a murder as a suicide? Would a burglar? A rapist? Who would have the evidence knowledge to set up the scene with such detail? When compared to the list of known acquaintances, the list becomes short indeed!

Efforts in case reconstruction rely upon the analyst capturing the informational value of evidence at the crime scene. No amount of laboratory analysis can restore the original informational value of evidence as it was at the scene. Only the person(s) at the scene can make these observations and provide vital details to the courts. These details are supported thorough documentation and provide the answers to the key questions confronting the analysis and reconstruction efforts, the trial and the penalty phase of the process.

The burden of the penalty phase in court often rests in the quality of the original scene processing. The difference between a finding of innocence and guilt may rely on the prosecutor’s ability to portray the perpetrator’s intent at the scene as demonstrated through physical evidence and scene reconstruction. Take note of what we talked about previously: thinking not like only a prosecutor, but as a defense counsel when analyzing and trying a case: Assume, before you started this analysis that, if holes can be poked into it by a defense counsel, that the defense attorney is likely to insinuate there has been investigator or prosecutor incompetence or prejudice, pointing to the flaw(s) in the analysis.

Considerations in Crime Scene Analysis

Where then, does one develop crime scene analysis skills? The following methodology defines an additional overview of considerations for such an approach.

A Crime Analyst's Approach

Actions lead to a given incident. Nothing "just happens by itself". In viewing crime for the purpose of analysis break the crime down into defined moments leading up to and including the crime and its immediate aftermath.

These moments are simply those things that must transpire for the crime to occur. Through this process we create a motion picture, albeit imperfect, which we can then project into our reports, and from there into the courtroom. Here is the scenario of a burglary/murder.

- The burglar arrives at the scene
- He/she enters the residence.
- The burglar begins his search for valuables.
- The resident is awakened and realizes a burglar is present.
- There is an encounter between the burglar and resident.
- A resulting fight ends in the killing.
- The burglar completes the search for valuables.
- The burglar flees the scene of the crime.
- The burglar hides or otherwise disposes his/her fruits of the burglary and tools of the crime.

We can "fill in the blanks" almost immediately. Some events had to have occurred. Example: to kill, one must have a violent encounter. If there is no one except the decedent left at the scene we know the murderer must have left the scene.

We can break down the obvious moments, or individual actions, in our scenario even further. For example, in considering the event of the altercation, these actions *might* have occurred:

- Rushing the burglar by the resident.
- Both falling to the floor.
- The weapon being obtained by the burglar.
- Subsequent blows to the resident's head using the weapon.

In the analysis process we seek to break down these actions into as great a number of subordinate details as possible. The evidence discovered at the scene serves to define these subordinate actions, which allows us to more completely understand our event.

Some events may be better supported by physical evidence than others. In fact, others may only be surmised based upon the entire picture as it has developed thus far. For example: *How did the burglar enter?* To determine that we check for signs of forced entry. The doorway? Is there a sign of force applied? The handle bent? A pry mark that has fractured the wooden frame or the door itself? Are there marks of entry to the

windows? Was the glass broken? Was the window pried up? Is one window the only window that is unlocked?

Evaluating Evidence for "What it proves"

As we examine the evidence that support our tentative conclusions, we must consider each in light of its basic nature, how the facts relate to each other and what they tell us about the sequence of events.

With regard to our approach we simply consider the specific action/evidence being evaluated, asking ourselves: "What is this?" and "What purpose did it serve?" If we find a bloody cinder block at the site of our burglary/murder altercation, our answer to the first question is easy, this is a cinder block. Its use as a weapon may be suggested.

We now ask: How is this related to the other items on the scene or to the victim. By answering these questions we often shed light on the "What purpose did it serve?" question. In our instance of the cinder block if we were to find a similar one in a pile inside the home we have established a link to the home. The cinder block was present at the scene by choice of the owner rather than being brought to the location by the burglar.

Last, we must consider our actions and evidence in light of timing and sequencing issues. Each is a specific concern. Timing helps establish the actual or relative time of the crime. Classic examples are body temperatures and the onset of rigor mortis. Timing aspects help in establishing when or perhaps over what period the crime occurred.

Sequencing helps establish the order of events and actions within the framework of the incident. We certainly know here that the use of the cinder block as a murder weapon came after the murderer came on the scene, and became, in all probability the weapon of choice by the murderer after entry and after confrontation by the murder victim.

The Auditing Function: Examining, verifying and/or correcting the analysis

Each action becomes, much as in a storyboard, a window or snapshot of the crime. Through our consideration of sequencing, we then place these snapshots in a logical and supportable order.

As this order develops, specific issues may also develop. Contradictory evidence, indications of some missing part of the picture, or indications of staging may present themselves.

Auditing the crime based upon the actions may help clear up our concerns. Remember, crimes do not occur in a vacuum. We may be forced to look beyond the immediate issues/evidence for background indications that some event occurred.

Consider being faced with a situation in which we are called by a witness who asserts he/she saw a victim first cut himself in the course of a suicide but then chose to shoot

himself to complete the act. Even if we believe the victim prepared both methods, in advance of his first trying to slice his/her wrists, we should certainly expect to find evidence of bloody fingerprints on the weapons involved, or somewhere on the surrounding surfaces. Failure to find such evidence creates a clear suspicion that these actions occurred not quite as described by the individual who reported them.

This auditing function and the anomalies we discover through it also serve to focus efforts of the investigation. If we see indications of a missing piece of the picture we are building we then must look for the missing piece of evidence to fill in the picture.

Did we miss some item of evidence at the scene? When we examined the location did we not have enough information at the time to identify its true relationship in our analysis?

Auditing also looks beyond the primary evidence and issues. It helps us to decide which of some group of possible events or actions is the more probable. It helps give us the complete picture, the one that satisfies all conjecture.

Rating Conclusions and Actions

In deciding what to believe in a crime analysis we must also consider that not all evidence has the same weight or deserves equal consideration. An informal rating is really set up in our analysis. An item can be considered:

- Incontrovertible
- Strongly supported
- Supportable
- Probable
- Possible

Incontrovertible actions set the overall stage of our incident. Neither defense nor prosecution should honestly be ready to attack the likelihood that these actions occurred

But not all evidence stands in such strong regard. However, we seek some level of reliability for the overall event we are analyzing. Whatever the item of evidence, if we use it to claim that some action occurred in a certain way we must be able to articulate the "why" of its support for the conclusions which have been drawn.

Given an action that rates as strongly supported and several others rating possible and probable; it is not inappropriate that the analyst draw some conclusion from the conglomerate. The analyst must not however, base the overall conclusion on the highest rated action defining that event. The conclusion should be based on a review of all related-actions.

A second issue is that the reliability we assign to an action or item of evidence cannot change within the analysis.

Reviewing the Sum of the Parts

Using the processes described we should:

- Establish specific snapshots of the crime based upon evidence found.
- Consider these actions in light of what they establish individually, then in relation and in combination with other actions.
- Decide how supportable each action is based upon the evidence available.
- Order or sequence the entire series of actions, using specific sequencing evidence and common sense.
- Where contradictions and questions arise, audit the actions of concern looking for background indications to help decide what happened.
- Using the actions and evidence established, define the events and our overall conclusions about the crime. We decide these conclusions based on all known information.

The end product of this analysis is a defined view of the crime. We may not understand the "why" behind the actions, but we do know they occurred. In effect this product is an investigative framework. Whatever the case, from this framework we can expand our considerations to any investigative issue necessary

The use of experts in the forensic sciences has greatly escalated in recent years. Each expert, however, is restricted to giving testimony in his or her specific field. A homicide case may include experts in the fields of firearms, fingerprints, serology, drugs, pathology, dentistry, anthropology, documents, bloodstain pattern analysis, and others. The court has t**o** attempt to weave together a comprehensive whole out of a multitude of witnesses, each of whom can only explain a small portion of the complete story. Making a complicated case simple so that a court can comprehend the facts and apply the testimony provided is not an easy task.

A crime scene analyst, however, after having studied all the physical evidence and analyses performed by the experts, can inform the court as to the most probable sequence of events. In relaying this to the court, the analyst will explain why each conclusion was reached and what physical evidence has been used to determine the conclusions.

Many prosecuting attorneys' offices are burdened with such heavy caseloads that occasionally some points of evidence are misunderstood as to their importance, or how two pieces of evidence that corroborate the conclusions of the reconstruction are linked together. A thorough understanding of the occurrences is vital for proper prosecution. A crime scene reconstruction is an invaluable aid to providing this understanding.

Physical evidence, or the lack of it, will make the difference between positive knowledge and guesses, fact and fantasy, and proof of or speculation about the series of events.

Using the Laboratory/Utilizing the Expert

No analysis of the scene, no deductions from physical evidence may be complete without utilizing testing processes which have developed over the years, and which continue to be developed, for the analysis of physical evidence which can point us in the direction of solving crimes, particularly crimes like murder. These techniques may not currently be available in a country. However, they should remain in the mind of the investigator/analyst and the prosecutor for a variety of reasons. Certainly, if they are available, under the right circumstances, they should be utilized. If they are currently unavailable we should push to have them departmentally budgeted, installed as part of recognized and reliable departmental procedures, people must be trained in them and than they should be used for crime investigation and prosecution purposes.

Our subsequent discussions about these investigative processes will be brief, and for informational processes. Don't be discouraged if any or all of them are not available. Instead, work to make them available in your jurisdiction.

Forensic Science and Its Utilization

1. Forensic Pathology

Doctors, who should be specialists (forensic pathologists) in assessing the mechanism and/or cause of death, may be used to give a preliminary opinion (initial/pre-autopsy assessment) and then must autopsy the deceased to give a final cause (post-autopsy assessment) of death. A forensic pathologist must be prepared to explain his/her expert conclusions to a court of law, and in accord with the legal processes sanctioned in that. The cause of death and the manner of death (probable instrumentalities used to cause death) and the reasons for conclusions as to cause of death must be reduced to a written report by the pathologist.

Examples of Modalities of Death include:

a) Natural
b) Accidental
c) Homicide
d) Suicide
e) Unknown

Examples of Classification of traumatic deaths:

a) Mechanical
b) Thermal
c) Chemical

d) Electrical
e) Asphyxia (this may be included under one of the other classes, i.e., chemically induced which caused respiratory failure, strangulation which may be listed under mechanically induced, etc.)

Experienced pathologists can assist the prosecutor/analyst/investigator with a detailed explanation of the instrumentalities of the cause of death.

Examples of Expertise:

a) A laceration that appears, on first examination, to be caused by a knife can clearly be identified by a pathologist as blunt force trauma, etc.

b) The size and nature of the wound can lead to identification of the weapon.

Example: The decedent has been stabbed. The wound leaves a hilt mark. As well, the wound itself bears a peculiar tear on the blunt side of the wound. From these facts, aside from the design of the hilt guard, the pathologist may be able to determine the length of the blade used (the blade went in up to the hilt, and may be measured internally) and the width of the blade. As well, the peculiarity of the tear on the blunt side of the blade was caused by a peculiarity of the knife (i.e., the knife may have had serrations or ridges on the blunt side of the knife for scaling fish, etc.).

Example: The size of the bullet hole tells us the caliber of the gun used. Recovery of the bullet during autopsy can lead to ballistics identification of the weapon used. Tracing in the wound may show us the bullet was lead instead of a non-trace material. Contact wounds can be determined from powder burns, as well as the approximate distance from the gun to the body in many instances. Distant wounds lack smoke soot and stippling. A typical distant wound has a circular skin defect and a rim of abraded skin around the edges. The path of the bullet in the body may determine the relative positions of the victim and the person who shot him.

These are just some of the possibilities that may be deduced by a pathologist. As a further example, let us assume that death is not instantaneous. The victim may linger in the hospital for many days, or even months, then die of, for example, pneumonia. The pathologist can testify that although the immediate cause of death was pneumonia the pneumonia would not have happened but for the bullet…hence, the bullet was the operative cause of death. This is just one of the reasons having an *experienced* pathologist is important

Specimen collection with concomitant drug testing can give us enormous information. Examples might include blood testing for drugs and alcohol. Were there any other toxins in the blood? Urine testing is another possibility, considering that certain toxins are found in much larger amounts than in the blood. Gastric contents may tell us not only about the cause of death but the time of death.

2. Forensic Odontology

A trained dentist can qualify to practice forensic dentistry (forensic odontology, or the application of the science of dentistry to within the court processes).

Specifically, dentition can be used to I.D. individuals by comparing aspects of the victim's teeth with dental records that were kept prior to death. As well, there can be comparisons of dentition with bite marks or other patterns such as those on food, on pencils, etc., to identify criminal suspects.

3. Forensic Anthropology

Forensic anthropology is the ability to understand the forms and variations of the human skeleton in individuals, complementing the forensic pathologists emphasis on soft tissue. This profession also includes the (1) interpretation of primary outdoor death scenes and postmortem processes (forensic taphonomy, which also utilizes insect life, botanical remains and other processes which may help in the correlation of location of recovery or remains to the location of death, the process of transportation, if any, to the location of the body; (2) Recovery of scattered remains (forensic archaeology); (3) Interpretation and reconstruction of soft tissue form based on skeletal remains (for example, facial reconstruction); (4) Interpretation of sharp and blunt force injuries, particularly to the bone.

This science includes archeological investigation, examination of hair, insects, plant materials, footprints, determinations of elapsed time since death; photographic or computer generated superimposition; detection of anatomical variants; analysis of past injury and medical treatment. However, the most important use remains the identification of the decedent

Within the identification process the forensic anthropologist can create a biological profile indicating age, sex, stature, ancestry, individual features, anomalies from a wide variety of remains, and portions of remains.

Forensic Serology (Blood, Bloodstains and Other Body Fluids)

Serology involves the examination and analysis of body fluids, particularly blood. Aside from blood we must also consider saliva, semen and urine.

Blood Analysis

Let us assume you visit the scene of a possible crime. It is a room occupied by a man who was last seen with a woman who has since disappeared. She had no reason to simply vanish, and she had once complained about the man hitting her. You see what appears to be a fresh stain on the corner of a rug. Blood? The man says he had a beefsteak and the gravy spilled on the rug

- Make a careful visual examination of the area to assure yourself it has visible characteristics of blood;
- Apply a suitable screening test to, at least, give yourself more assurance of the nature of the stain;
- Use a specific and sensitive test to confirm the presence of blood;
- Determine if it is human or animal in origin;
- Than, obtain a characterization of the blood using a genetic marker or DNA.

No single screening test is absolutely reliable for the presence of blood so more than one test may be used to confirm the first result. The first tests are generally catalytic color tests using such chemicals as fluorescein and luminol. Confirmatory tests (primarily crystal formation tests) and others will back up the primary test to assure the presence of blood in the sample. The next test is to apply a Species Origin Determination test such as Serum Protein Analysis. Finally, there are the genetic markers in blood which break down the sample into human blood groups (e.g. A, B, O and AB) Note: Frequency of the blood groups, in general, is as follows: 40% of the population is A, 10% is B, 5% is AB and 45% is O.

If we have the woman's blood type, and the man's for comparison, we are well on our way to obtaining significant physical evidence in building our case. A serologist would use Antigen-Based markers, or variants thereof, such as the Lewis System. the Rhesus (Rh) system, etc. Other tests involving the use of immunospecific techniques such as the Gm and Km systems can further our identification of the blood. Protein markers, enzyme markers, and other tests would further push our ultimate objective: a forensic characterization of the blood to associate stains as nearly as possible from whom they could have come.

If the woman's body is eventually found and blood samples are obtained there are further tests that are available which can reach a degree of certainty that will allow most experts to testify to the probability of the blood sample being the woman's. Population frequencies bring an experts conclusions, using these tests, to an *almost* certitude.

Biological Fluids and Stains

Seminal fluid and saliva can be important factors in any case, particularly sexual assault cases. If a woman is sexually assaulted and killed, is there a semen sample that can be obtained utilizing a swab, for example, of the woman's vagina? The identity of the perpetrator may be drawn from the recovered sample. Clothing, such as panties, skirts, etc., may be important for the recovery of incriminating fluids. Saliva, as well, can be detected as a remnant of oral intercourse. It can be recovered from cigarette butts, stamps on envelopes, etc. Again, the identity of the criminal may be obtained through analysis of the remnant of this bodily fluid. Sweat on a shirt? A remnant of a body fluid that may identify a criminal, or a victim may be on it.

There is a principle developed by one of the first great criminologists named Locard. His principle:

Whenever two objects come in contact with one another there will be an exchange of material from one to the other.

Example: Two individuals engage in a hand-to-hand combat. Utilizing Locard's principle there should be traces of each man on the other, whether it is skin, clothing or whatever. Let us assume one of the men scratched the other with his fingernails. Under the fingernails of the individual who did the scratching there should be traces of the other man's skin. Likewise the man who was scratched will have scratch marks, or other material, such as blood or trace elements on his clothing.

So, whether you are dealing in blood spots, torn clothing, a cloth bag used to carry money, a rug which a decedent was wrapped up in and buried, a jacket worn by a mugger, a dress worn by a rape victim, there may be traces of the crime, and from those traces may come the evidence to turn a suspect into a defendant.

DNA

DNA "fingerprinting" is one of the most talked about techniques of identifying, matching and/or comparing characteristics of organic material. DNA (deoxyribonucleic acid) is genetic material. It is inherited from our parents, half of that material coming to us from our mother, the other half from our father. When a newborn is created all of its characteristics are contained in the DNA. It is unique to that person (with the exception of identical twins). It is unchanging for the rest of the life of that individual.

Every cell in a person's body contains the same DNA. It can be found in blood, saliva, all bodily excretions, in some hair, in shed skin and even sweat on the armpits of a shirt. It can survive as an element in blood, semen and other materials for years. DNA from two individuals does not mix and combine. It remains unique and can be tracked to one individual. It can identify familial relationships, particularly "first degree" relatives such as mothers, fathers and brothers and sisters.

If DNA testing facilities are available samples for testing consideration should be taken of:

- Fingernails
- Tissues, paper towels, napkins, swabs, and everything in a bathroom wastebasket.
- Cigarette butts, straws, cellular telephones (they came in contact with the mouth), toothpicks, and anything else that might contain a saliva trace.
- Pillows, blankets, sheets, dirty laundry, mattresses
- Hats or headgear of any type
- Eyeglasses and contact lenses
- Used stamps, envelopes
- Tape, ropes, cords or any ligature
- Used condoms
- Any intimate contact item

If DNA testing is not available in a jurisdiction it should be considered for acquisition because of its investigative analysis possibilities. Cost factors for analysis are steadily going down, time needed for complete analysis is decreasing, equipment costs (and the size of the equipment) are decreasing, and new technologies that are simpler and more expedient than they formerly were have been developed.

BLOODSTAINS: A Special form of Reconstructive Evidence

Interpretation of stains, patterns, and individual drops of blood can reveal the origin and the actions that caused them. This adds many details to the scene analysis by describing body positions, motions, and the sequence of events which occurred during the assault and, perhaps, after death.

Locations Found

Bloodstains may occur as clear or diffuse patterns within the body or outside of the body on garments, furnishings or on the structures at the scene. The forms of patterns are not always stable and should be observed and documented when first encountered. Such patterns are subject to alteration by the effects of weather, time and the actions of medical or other personnel active at the scene.

Within the Body

Stains within the body take the forms of lividity, bruising, and minor or extensive internal hemorrhaging. Lividity is a result of the diffusion of blood under the direct influence of gravity, and is emphasized by the flow of blood through the path of least resistance. Lividity begins immediately after the circulation of blood ceases, but usually becomes visible within two to four hours after death. For periods up to twelve hours the accompanying discoloration can be shifted if the body position is significantly altered. After about twelve hours, the lividity becomes “fixed” in the position relative to the

death. These time estimates vary with the overall environmental conditions that affect the cooling of the body or the flow of blood within the body.

Lividity appears as a light-to-deep-purple discoloration in the flesh. The degree of contrast at the pattern edges will describe the limits of lividity; therefore, skin color may affect the ability to see the lividity. Lividity may also be affected by the medical condition of the subject and environmental conditions at the crime scene.

This discoloration of the flesh supports conclusions regarding body positioning.

Example: Movement after death. such as by the alteration of the body's position through an effort to re-stage the scene or scene location.

Example: A body that has been hanging for five hours since death and then moved to a prone posture will retain the lividity in the feet and hands because the extensive lividity will not dissipate. The post mortem movement of the body can be detected by the analyst who looks for these blood patterns and notes their inconsistencies with the current body position.

Outside the Body

Bloodstains outside the body may appear on:

1) Flesh and clothing of the victim and suspect; or
2) On fixtures and structures.

Flesh and Clothing

Stains on the flesh and clothing relate to the posture and movements of the victim and/or the suspect at the time of bloodshed. Care should be taken to correlate flow patterns on the body to its position when found. These blood-flow patterns are related to the other elements of the scene. Warning: Since blood flow patterns are susceptible to change when the body is moved, correct analysis may be lost if they are not recorded until the autopsy.

It is for that reason, if possible, it is recommended that clothing which contains blood patterns be photographed on the body, processed for trace evidence and then removed at the crime scene, layered with clean paper (or newspaper) and placed into a paper container to be dried out at room temperature. This process should be worked out with the coroner's office in advance because it is the only way to preserve the patterns of blood on the clothing of the victim.

The practice of enclosing the body in a rubber or plastic bag will destroy bloodstain patterns as body fluids seep onto the clothing from the wounds during transportation of the body. Even though thoroughly photographed, the clothing should be collected from

the victim while at the scene. The clothing can then be preserved for later examination by the laboratory.

Fixtures and Structures

There is much that can be determined from the shape and number of individual blood droplets impacted on a surface from the overall collective pattern of a series of droplets or from the shape of large stains of blood.

Stains of blood outside the body relate to the relative positions and actions of the participants. Apart from the inherent structure of blood we have the predictable components of shape, volume, distribution, sequencing, and aging properties that can accurately provide details towards the final reconstruction of the scene.

Expert Interpretation

The final interpretation of these types of blood patterns is best left to the trained and experienced expert to resolve. Interpretation of blood patterns is best performed after the morphology of the wounds to the victim and suspect has been determined from medical reports or the post mortem examination of the body. The morphology of the wounds may determine the nature of the weapon, thereby limiting the manner in which the tool could have been used to create and/or generate the bloodstains.

To accurately interpret a bloodstain pattern, the investigator should know the wounds of the victim, the type of weapon, the dimensions of the scene and ultimately the blood patterns themselves. If any elements are removed, the interpretation of the pattern becomes more difficult.

Additional Observations

Interpretation of blood patterns is a complex specialty requiring in-depth training. However, it can preliminarily be performed by the analyst while at the scene as a tentative aid only.

Examples of general observations the analyst may make at the scene include:

1) Arcing patterns of blood on a surface can be the result of motions of the victim or suspect as the weapon of the assault is being swung or as the victim moves bloody arms and hands in defensive gestures. These broad patterns will be composed of circular and/or teardrop droplets of blood. A continuous pattern which strikes a corner of a room will leave what appears to be two separate patterns, one with elongated drops, the other with circular drops. This is a function of the walls being perpendicular to each other and should not confuse the experienced investigator.

2) A fine misting of blood on the wall or ceiling which is accompanied by larger areas of heavy blood is an indicator of a weapon such as a shotgun or high velocity firearm. Such patterns will include additional materials such as bone fragments, soft tissues and/or hair. There will usually be damage to the wall or ceiling that results from the projectile.

3. A fine misting of blood on the wall and floor accompanied by a radiating hemisphere of larger droplets usually indicates a bludgeoning to the head or other exposed flesh by a blunt object; e.g., a lamp, baseball bat, or the flat side of a small hatchet. It is likely that the lower portion of the perpetrator's clothing will have similar patterning and may reflect the posture of the assailant. For example, if the perpetrator is kneeling on his right knee, the right thigh will have bloodstains, while the lower leg may have none. These patterns usually do not contain bone fragments, large deposits of hair, or soft tissue.

Generally, within a single arcing pattern, as the amount of blood
Deposited increases so too will the size and number of droplets comprising the pattern. This may give the officer an investigative lead as to the type of weapon used. For example, a hammerhead, when swung back from the impact point, will usually not leave as great a pattern as would a machete or baseball bat used **in** the same way.

5) Fine blood spots on the toe of a shoe and the shin area of the same pant leg support a kicking assault; whereas, bloodstains in the arch of a shoe, accompanied by patterns low on the opposite pant leg are compatible with a stomping assault.

Caution!! There are some who would lead the analyst to believe that our interpretation of blood patterns is predictable from individual blood droplets. Nothing could be farther from the truth. All of the formulas which can be used to determine the angle of entry of a blood spot are relevant only on a SMOOTH and non-porous surface. A conclusive interpretation of a blood pattern is built upon the examination of the total pattern, not individual droplets. It is possible for drops within the pattern to give false information that will mislead. Rarely will the overall pattern mislead the reconstruction, especially when taken into the full context of forensic analysis.

The Number of Blows to the Victim

It is often stated that it is possible to determine the number of impacts to the head of a victim by examination of the blood at the scene. This is possible only if the bloodstains are taken in context with the entire crime scene and with knowledge of either 1) the tool which was used and/or 2) the wounds which were inflicted.

Most experts acknowledge that the first bludgeoning blow to the head will not result in a deposit of blood on the tool; therefore no blood pattern could be cast from that tool. Many will look at scene patterns and "add one" to their interpretation. However, this discounts the reactions of the victim, if the second blow strikes a "clean" surface of the head (as if the victim turned to face the assailant or covered the head with an arm), that second impact would leave no blood on the weapon either. This might continue for several blows until a "bloody surface" was struck which would then transfer blood to the

tool. Though it is reasonable to state, "The number of blows can be determined from the bloodstains," the true expert will discover that without knowledge of the wounds, the tools or the true dimensions of the crime scene, it is often not possible.

Position and movement of the participants

It is often stated that it the positions and movements of the participants at the scene can be determined by an interpretation of the blood patterns present. This statement is the foundational premise of the field of "blood stain interpretation". However, the expert must also be aware of the injuries to the assailant as well as those of the victim. A presumption that only the weapon will be casting blood onto the scene surfaces will lead to false interpretations. It is therefore critical to know, not only the nature of all wounds, but also the serological characteristics of the blood at the scene and the "degrees of motion" possible for the participants. With this knowledge, then blood patterns may be interpreted in light of an origin from aggressive behaviors, defensive reactions or the actual weapons involved.

All of these tests can only be used if they truly simulate the dynamics of the human circulatory system or the conditions of exposed blood sources at the time of wounding. Firing a 9mm into a blood filled sponge is not a reproduction of the dynamics of the same weapon into the clothed body or to the head. Beating a sponge with a hammer does not duplicate the "container of blood" that the human head represents at the time of contact. It is not suggested that the "expert" must use human cadavers with induced blood pressure, however it is imperative that the testing media used as a foundation of expertise in court, have a relevancy to the patterns encountered in the real case world.

Most experts realize the limitations of their endeavor and provide very conservative interpretations of the crime scene evidence and a well-documented reconstruction of the events and actions within the crime scene. A "step by step" reconstruction should be able to with **stand** the most critical review because each and every interpretation that makes up the offered reconstruction has been supported by forensic results from any applicable discipline. Bloodstain interpretation is but one of many which build the world of crime scene analysis.

FINGERPRINTS

Most people have seen enough old movies to know what fingerprints are. On the fingers, palms of the hands and soles of the feet there is *friction- ridged skin.* The patterns formed on these skin surfaces remain the same throughout a human's life span. All individuals, even identical twins have different fingerprints. The skin has pores through which small sweat-glands release their content onto the skin surface which leaves a latent print residue which, when pressed on a surface leaves an impression of the print pattern which can then be recovered, maintained and subsequently compared with exemplars to determine whose print impression has been left at the scene.

To obtain, or *lift*, a patent, latent or impressed print either physical, chemical or special illumination, such as laser or narrow band pass illumination or oblique lighting may be used. Physical methods include the application of fine particles such as powder dusting, to the fingerprint where it adheres. Chemical methods include iodine fuming using super glue and ninhydrin which reacts with the amino acids in the prints to bring out the print. Other methods or substances include iodine fumes or iodine reagent spray, gentian violet, Liqui-Drax, magnetic powder, DFO, silver nitrate, Amido Black, Ardrox, etc. Use of any of these methods is generally determined by the print that you need to lift. For example, Sudan Black is best used on surfaces made difficult by oils. Ardrox, a fluorescing dye, might be used on colored surfaces, DFO on porous surfaces (it is also an amino acid reactor).

Note: All prints obtained at the scene must be photographed. Sometimes it may be necessary to bring the print back to the lab to photograph. In that case care must be used not to ruin the print. For example, if you cannot photograph a print on a door in the field because of placement or possible damage to the print, as fanciful as this may sound, you may be required to take the door back to the laboratory to photograph the print.

Footwear and Other Impressions

Footprints leave their own distinct identity. They can be left on all types of surfaces and locations. Example: A burglar climbs into a window. Hence, we look to the ground at that point of entry to determine if a shoeprint has been left. A murder victim bleeds. Did the suspect step into the blood and leave impressions?

Footwear prints can not only potentially be able to tell you what make of shoe the suspect was wearing (tread marks on tennis shoes, basketball shoes, heels on dress shoes all have brand shapes) they can also tell you the size of she the murderer wore, the number of people involved in the crime, gait characteristics (such as walking problems, a persons stride, possibly the height of an individual). A trail of prints can lead to secondary crime scenes, to the exit location, to more evidence, tire impressions, etc.

Aside from measuring and photographing the shoeprint (with photographs make sure a rule is present in the print to give a clear indication of size) casts (preferably made with dental stone) can be taken.

Lets examine other possible prints: Snow prints can be made (using a product called Snow Print Wax. Tire tracks are another area for photographing and casting. Patterns of wear, make and model of tire are wonderful evidence for comparing tires on a getaway car.

Looking for Other Evidence

A tool is used to break the lock on a door so the murderer may gain entrance to a house. A tool is used to pry a screen off a window. Tool marks may be identified to the make of the tool by the mark left on the object attacked. And, if one gets lucky, the tool may have

some key characteristic, such as a chipped piece, which can be absolutely compared to a tool found in the defendant's home.

A woman is raped and murdered. Pubic hair that is not hers may be found on her body, on her clothes or at the scene. It can be compared to a suspect's hair. Or her hair may be found on his clothes. It may be his, waiting for comparison. Or a cap is found with hair inside the cap. Is it the suspects?

A few items about hairs: If there is a follicle on the hair often a blood type can be determined (if the defendant is a secretor). The nature of the hair can often determine the race of the defendant. Dyes, which are present, can be analyzed and compared. And how about DNA evidence from the hair follicle. A positive comparison can be made.

Rope was used to bind the victim's arms and legs. Cordage may be compared in a number of ways. Examples: Type of twist, crowns or turns per inch, diameter in a cross section, filaments in each braid, etc.

Carpets, upholstery, blankets, clothes, etc shed fabrics. Torn pieces of cloth can be matched to each other. Was the fiber synthetic or natural? Individual characteristics of the weave? It takes work, but these objects can be manually collected. Or obtained through static lifts.

A note is left on a body: "Stop me before I kill again." It is written in ink by a pen not found at the scene. An examination of the not indicated an erasure. What can be deduced? A suspect is captured and asked to give a handwriting sample. The investigator thinks he has tried to conceal his guilt by distorting his writing. What can be done? Here are some of the things a questioned documents examiner may help with.

- Distinguish forgery from genuine writing
- Detect erasures or substitutions on documents
- Restore erased or obliterated writing
- Analyze ink, paper and chemicals in the document's creation
- Compare and attribute handwriting, signatures, printing and other writing to individuals

Firearms and Firearms Evidence

All kinds of guns exist in our society: revolvers, semi-automatic handguns, assault rifles, rifles, shotguns, etc. They come in a multiplicity of shapes, makes and models, manufacturers, etc. They have different firing mechanisms. Firing and shell ejections systems differ, with the three most prominent in automatic and semi-automatic weapons utilizing blowback systems (most submachine guns), recoil or gas piston.

Rather than go into the particularities of how each operates we will focus on the ballistics examination characteristic for comparison purposes. In a prior century gun smiths realized that an inner "rifled" barrel (one with spiral indentations) generated more

accuracy in the bullet when the gun was fired. They cause the slug to spin, keeping it on a straight course when it leaves the barrel. This process, along with others, eventually generated the modern process of firearms and/or ballistics examinations.

A slug, when fired from these weapons has the impression of the marks inside the bore etched into it. These markings are identical to other slugs fired from the same weapon, with the exception that they are in the reverse of the spiral indentations inside the barrel. The raised areas are called are called *lands* and the depressions are called *grooves*.

The size of the firearm barrel, and the slug that can be fired through it designates the *caliber* of the gun, i.e., 9mm. General rifling characteristics to be determined through the slug are the caliber of the bullet (and hence, caliber of the weapon), number of lands and grooves, direction of the twist of the rifling, degree of twist and widths of lands and grooves. From the expended cartridges we can determine caliber, shape of the firing chamber, location of the firing pin, size of extractors and ejectors (if any), geometrical relationship of the extractor and the ejector. With this information class characteristics can be compared (if there is a comparison database) to match the make and model of the firearm. Note: Virtually all firearms have serial numbers etched in them and if the firearm is recovered the path of ownership of the gun can sometimes be tracked using the manufacturers number.

Cartridges are either rim fire or center fire. When the trigger is pulled a firing pin strikes a chambered cartridge, a small quantity of primer is ignited which in turn ignites the powder inside the shell, the expanding gases from the controlled explosion projecting the bullet through the barrel, and in the direction the gun is pointed.

Note: When a silencer is used on a weapon it too leaves its own individual mark on a bullet.

When the firing pin strikes the cartridge it leaves an individual marking on the shell which, when recovered may be compared with any other firing pin mark left on another cartridge, for example, in a test firing. The breech face that rests against the cartridge also creates its own marks, and if a weapon ejects a slug (as in a semi-automatic or automatic weapon) more comparable marks are left on the shell.

All gunshots release GSR (gunshot residue) that is released by the cartridge when the weapon is fired. The blowback of the weapon allows this particulate material to coat the shooters hand, or other portions of his clothes or body. Finding GSR (and there are standard tests for this) on the suspect means the suspect fired a weapon, they were present when a weapon was fired or they handled a recently fired weapon. If sensitive specific tests are done tracking individual batches of ammunition is also possible.

Shotguns do not have rifling in the barrel. They also have ammunition which does not have a single bulled, but a multiplicity of *shot*. As a general rule shotgun barrels do not leave identifiable markings on shot. Sawed-off shotguns may metal burrs left on the shortened barrel muzzle that may mark shot or wads in an individual pattern. Rather than

classifying shotguns by caliber they are identified by *gauge*, a designation that has refers to the number and size of the shotgun balls the weapon fires. Note: It is possible to have a single, large bullet fired from a shotgun.

Dos and Don'ts of Obtaining Firearms Evidence

- Only rubber-coated or taped tools should be used to probe for bullets or to extract them from a wall, doorjamb, etc. If necessary remove the jamb and let a firearms expert extract the bullet at the laboratory.

- Be careful not to remove possible trace evidence that may be on the bullet, i.e., blood.

- We recommend not marking the slugs for identification but do recommend placing them in small plastic vials that are then marked.

- Don't pick up a weapon by sticking something down its barrel. It can distort or mark the lands and grooves. Put something like a pencil behind the trigger guard to lift and transport the weapon.

- If a weapon is to be finger printed talk to a firearms expert about the best way to do it without damage his ability to conduct his examinations.

- Cartridges may have fingerprints (people load their weapons by hand). So, handle the cartridges without disturbing the exterior.

- Use a metal assay test to identify GSR on a suspect

- Be careful with loaded weapons, and never transport a gun that is loaded.

There are many other things to learn about firearms. These are just a few basic principles that will assist the analyst in doing his/her job.

CONCLUSION

This manual does not attempt to be a complete examination of the subject of homicide/site investigation. Rather, it is a primer to lead you into further and more in-depth exploration of the subjects discussed. Analysis, investigation and prosecution are subjects that require constant study and updating of that study. Equally important is the practice of the subject. That is the only way one truly becomes a capable practitioner in any field.
