PHYSICAL EVIDENCE

HANDBOOK

Prepared by the
Maine State Police
Crime Laboratory
Second Edition
1995

155918

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A crucial responsibility of every law enforcement officer at a crime scene is to identify, preserve and collect relevant physical evidence. The purpose of this handbook is to provide a practical guide which describes the proper procedures for the collection, preservation and handling of this type of evidence.

Maine citizens have every reason to be proud of our full service forensic science laboratory staffed with outstanding specialists. While laboratory personnel are a valued component of the criminal justice system, they understand that their continued effectiveness is dependent on cooperation and interaction with investigators.

It is our sincere hope that this handbook will facilitate the utilization of physical evidence in criminal investigations. We encourage all law enforcement agencies to make use of the services available at the Maine State Police Crime Laboratory. Working together, field investigators and laboratory personnel present a formidable team in Maine's effort to impact crime.

We are pleased to make this handbook available and look forward to providing forensic and technical services to Maine's law enforcement community in the years to come.

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While many think of evidence collection as directed toward the solving of crimes, in the case of traumatic or unattended death, the collection of evidence may be crucial toward establishing the identity of the deceased, reconstructing the circumstances of death and determining the manner of death - suicide or accident as well as homicide.

Medical examiners, unable to investigate circumstances and process scenes thoroughly themselves, depend heavily upon information obtained from and evidence collected by law enforcement officials. The medical examiner concentrates on the physical examination of the body and medical history, obtaining other data from police personnel through inquiry, a process less formal, but essentially analogous to the old coroner's inquest. Mutual co-operation is essential.

We were delighted to have been given the opportunity to participate in the preparation of this manual so that death scenes may be handled properly and uniformly - regardless of whether the death was homicide or not.

Sincerely,

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Sincere appreciation is offered to the staffs of the Maine State Police Crime Laboratory and the Office of the Chief Medical Examiner for their assistance in the preparation of this handbook.

The Maine State Police Crime Laboratory will continue to commit its financial and personnel resources to law enforcement training and to the development and evaluation of forensic evidence. Through technological development and training programs conducted at the Crime Laboratory and our staff's dedication to excellence, we shall strive for quality contributions to the forensic science field.

Michael P Harriman

Lt. Michael P. Harriman
Director

TABLE OF CONTENTS

PAGE

PART I - PHYSICAL EVIDENCE

A. STAFF AND SERVICES 1

1. ANALYSES/EXAMINATIONS PERFORMED AT THE MAINE STATE POLICE CRIME LABORATORY 1

2. SERVICES AVAILABLE THROUGH OUTSIDE AGENCIES 1

B. THE ROLE OF PHYSICAL EVIDENCE 3

C. HANDLING PHYSICAL EVIDENCE 6

1. PRESERVATION AND DOCUMENTATION OF THE CRIME SCENE 7

2. GATHERING ALL POTENTIAL PHYSICAL EVIDENCE 8

3. MARKING THE EVIDENCE CORRECTLY 10

4. MAINTAINING THE CHAIN OF CUSTODY 11

5. PREVENTING CONTAMINATION 14

a. Proper handling 14

b. Proper packaging 16

1) Blood/body fluids 16

2) Trace evidence 17

3) Fingerprint examination 19

4) Firearms identification 21

5) Tool mark identification 23

PART II - COLLECTION AND PRESERVATION OF PHYSICAL EVIDENCE **PAGE**

A. BLOODSTAIN PATTERNS 25

1. Photographing bloodstain patterns 25

B. BLOOD AND BODY FLUIDS 27

1. Immovable objects 27

2. Movable objects 27

C. CLOTHING 27

D. HAIRS AND FIBERS 28

E. GLASS 28

F. PAINT 28

G. MISCELLANEOUS TRACE EVIDENCE 29

H. KNOWN SAMPLES (STANDARDS) 29

I. FINGERPRINTS 30

1. Adhesive tape 30

2. Paper products 30

3. Small items 31

4. Medium sized items 31

5. Large items 32

J. FOOTWEAR AND TIRE IMPRESSIONS 33

1. Photographing footwear and tire impressions 33

a. Two dimensional impressions 34

PAGE

b. Three dimensional impressions 35

2. Collection of suspect footwear and tire impressions . . . 36

K. FIREARMS EVIDENCE 38

1. Handgun 39

2. Shoulder weapon 40

L. BULLETS AND CASINGS 40

1. Spent bullets and casings 40

2. Rounds of ammunition 41

M. TOOLS/TOOL MARKS 41

N. PHOTOGRAPHY 41

1. Operation of the Department's Nikon camera 41

a. Loading of film 41

2. Determining correct exposure 43

a. Nikon FM 43

b. Nikkormat EL 44

3. Removal of film 45

4. Flash photography 45

PART III - PROCEDURE FOR REQUESTING SERVICES

A. The Crime Laboratory Examination Request/ Evidence Receipt 47

1. Completion of the Examination Request/Evidence Receipt Form 49

PART IV - INSTRUMENTATION AND PROCEDURES USED IN ANALYSIS OF EVIDENCE **PAGE**

A. PROCEDURES USED IN THE ANALYSIS OF PHYSICAL EVIDENCE 53

1. Blood 53

2. Semen 54

3. Hair 55

4. Fibers 56

5. Fingerprints 57

6. Firearms 58

7. Gunshot Residue 59

B. INSTRUMENTATION 60

1. Fourier-Transform Infrared Spectrophotometer 60

2. Comparison Microscope (Transmitted Light) 60

3. Stereo-Microscope 61

4. Polarized Light Microscope 61

5. Argon Laser 62

6. Electrophoresis Equipment 62

7. Ultra-Violet Microspectrophotometer 63

PAGE

8. Comparison Microscope (Reflected Light) 63

9. Microscopic Measuring Projector 64

10. Fingerprint Fuming Tank 64

11. Poli-Light 65

PART V - THE MEDICAL EXAMINERS PERSPECTIVE

A. CASES OF SUSPICIOUS DEATHS 67

1. Cases in which the Medical Examiner responds to the scene 68

2. Cases in which the Medical Examiner does not respond to the scene 68

B. MOVEMENT OF BODIES 69

1. Photography, Diagrams, Chalking 69

2. Personal Property 70

a. Identification 70

b. Clothing 71

c. Medications 72

d. Water soaked papers 72

e. Suicide notes, tapes and other message forms 72

3. Trace Evidence 73

a. Loose objects 73

b. Hair samples 73

PAGE

c. Sexual Assault Evidence 74

d. Food 74

e. Insects 74

4. Fingerprints 75

a. Latent Fingerprints 75

b. Body prints 75

5. Weapons 76

6. Removal of bullets 76

7. Toxicology, DNA and Serology Samples 77

a. Sampling in autopsy cases 77

b. Sampling in cases not going to autopsy 77

c. Serology Samples 78

8. Testing 78

a. HIV Testing 79

9. Special Cases 79

a. Infants 79

b. Hit and run - pedestrian/motor vehicle 80

c. Questionable driver status in motor vehicle deaths 80

d. Diving deaths 80

PAGE

e. Environmental toxin or asphyxia deaths 81

f. Food poisoning 81

g. Hazardous equipment related deaths 81

h. Fire deaths 82

i. Bones and possible human tissue 82

j. Search for bodies of missing persons 83

PART VI - GLOSSARY 85

PART VII - APPENDIX

A. F.B.I. Policy regarding testing for Gunshot Residues.

B. Infant/Child Death Investigation Protocol.

C. Protocol for the Investigation of Violent, Unnatural, Unattended, Unexplained, Suspicious, or Suspected Deaths.

LIST OF ILLUSTRATIONS/TABLES

Figure/Table/Picture **Page**

1. Maine State Police Crime Laboratory Analysis/ Examinations Performed 2
2. Types of Evidence Used for Analysis 4
3. Marking the Evidence Correctly 11
4. The Crime Laboratory Examination Request/Evidence Receipt 13
5. The Druggist Fold 18
6. Collection Technique for Bloodstains 27
7. Collection of Known Standards 29
8. Collection and Packaging of Adhesive Tape 30
9. Collection and Packaging of Paper Products 30
10. Collection and Packaging of Small Items 31
11. Collection and Packaging of Medium Sized Items 31
12. Collection and Packaging of Large Items 32
13. Photographing Impressions (side lighting) 34
14. Documentation of Tire Test Impressions 37
15. Collection and Packaging of a Handgun 39
16. Collection and Packaging of a Shoulder Weapon 40
17. Microscopic Portions of a Hair 55
18. The Ten Basic Fingerprint Patterns 57
19. Microscopic Striations on a Bullet and Casing 58
20. Infra-red Photograph of Gunshot Residues 59
21. Fourier-transform Infrared Spectrophotometer 60
22. Comparison Microscope (Transmitted Light) 60
23. Stereo-microscope 61
24. Polarized Light Microscope 61
25. Argon Laser 62
26. Electrophoresis Equipment 62
27. Ultra-violet Microspectrophotometer 63
28. Comparison Microscope (Reflected Light) 63
29. Microscopic Measuring Projector 64
30. Fingerprint Fuming Tank 64
31. Poli-light 65

INTRODUCTION

As police officers, you must be highly aware of proper evidence collection procedures. This awareness must not be limited to the gathering of physical evidence. In addition, you must become familiar with the reasons evidence is collected and presented in a certain manner. This handbook is intended to familiarize the investigator with collection and preservation techniques and to provide information concerning services provided by the Maine State Police Crime Laboratory. This handbook is not intended to be a comprehensive treatment of all the factors involved in criminal investigation, but should be considered as a general procedural guide outlining necessary and efficient methods for dealing with physical evidence. It is important to keep in mind that the information and procedures presented here are intended to be used as guidelines.

STAFF AND SERVICES

The concept of the Maine State Police Crime Laboratory began in the early 1930's under the direction of Capt. Leon P. Shepard. A one room office located in the basement of the present Department of Public Safety Headquarters was the beginning that expanded over the years to occupy most of the basement area until funding was approved in 1985 to construct a new independent facility. The current facility located at 30 Hospital Street in Augusta, Maine opened on December 18, 1986.

The Crime Laboratory is presently composed of four sections: Forensic Chemistry, Fingerprints, Firearms and Photography. Each area performs specialized examinations designed to render aid to investigators and offers expert witness testimony in court.

Analyses and examinations performed at the Maine State Police Crime Laboratory: See Table 1.

Services Available through Out-Side Agencies

DNA Analysis
Typewriter/Handwriting Comparisons
Soil Comparison
Plant Identification
Computer Aided Crime Scene Sketching
Explosion and Fire Debris Analysis
Material Analysis
Blood Alcohol Determination
Drug Testing
Video Enhancement
Voice Analysis

TABLE 1. MAINE STATE POLICE CRIME LABORATORY ANALYSIS/EXAMINATIONS PERFORMED			
FORENSIC CHEMISTRY SECTION	**FIREARMS SECTION**	**FINGERPRINT SECTION**	**PHOTOGRAPHY SECTION**
IDENTIFICATION OF: Blood Seminal fluid Sperm cells Saliva	IDENTIFICATION AND COMPARISON OF: Spent bullets Casings Tool marks	DEVELOPMENT & EVALUATION OF: Latent fingerprints Footwear impressions Palm impressions Tire impressions	DOCUMENTATION OF: Physical evidence Court presentations Crime scene photography Crime scene video taping
DETERMINATION OF: Secretor status ABO blood type Red blood cell isoenzyme	Serial number restoration Gunshot residue detection Distance determination	COMPARISON OF: Latent & Visible Palm and fingerprint impressions Inked fingerprint & palm impressions Tire & footwear impressions	Aerial photography Infrared & ultra-violet techniques Slides Video tape duplication Photographic duplication
IDENTIFICATION AND COMPARISON OF: Hairs Fibers Paint Glass Impressions Physical matches Miscellaneous Trace Evidence	Crime Scene Processing	Crime Scene Processing Document Examination	

THE ROLE OF PHYSICAL EVIDENCE

In order for you, the police officer, to properly perform the task of evidence collection and preservation, you must understand the role physical evidence plays in criminal identification.

To begin, we will answer the question, "*What is **Physical Evidence**?*"

Physical evidence can be defined as **anything** which can be used to:

1. Associate a criminal with a particular crime
2. Clear an individual of a particular crime
3. Reconstruct the events of a particular crime

In order for an item to be considered physical evidence, it must achieve one or more of the above tasks. "Virtually any type of material can become physical evidence. **Table 2** shows the types of evidence frequently analyzed in the Crime Laboratory. These types can be divided into four basic groups; **Biological, Chemical, Physical**(Impression) and **Miscellaneous**. There are many methods available to the Forensic Chemist for examination of each type of evidence."(1)

The principle of physical evidence is based upon the theory of Edmond Locard who formulated the "Locard Exchange Postulate". This theory states

that..."objects or surfaces which come into contact always exchange trace evidence."(2) It is from this postulate on which the basis of ***Criminalistics*** is formed. **Criminalistics (or Forensic Science)** is defined as,"the application of science and scientific methods to analyze, identify and compare materials for presentation in courts of law."(3)

Table 2. TYPES OF EVIDENCE USED FOR ANALYSIS	
BIOLOGICAL	**CHEMICAL/MICROSCOPIC**
Blood Semen Saliva Biological Hair Botanical (plants) Pathological (tissue)	Fiber Chemicals Glass Plastics/Polymers Gun powder Metals Minerals/Soil Narcotics Paper
PHYSICAL (IMPRESSIONS)	**MISCELLANEOUS**
Fingerprints Firearms Number restoration Footprints Tool marks Fabric Typewriters Photocopiers	Laundry marks Voiceprint Photographic Polygraphy

The role of criminalistics involves the process of determining ***common origin*** of the evidence in order to achieve the previously mentioned tasks. The meaning of the term **common origin** is to determine if item "A" and item "B" could have come from the same source. "The *criminalist* determines common origin by performing

one or a series of tests that have a high if not total discrimination factor. He does so, so that if the exhibits originated from different sources, he would so be able to determine. When he has exhausted the battery of tests at his disposal and he still cannot discriminate between exhibits, he may state within a scientific certainty, the evidence could have come from the same common source or have a common origin."(4)

A second question which may be asked is, "*How does the criminalist obtain from the evidence the information which it carries*?" As previously mentioned, the role of criminalistics is the analysis, identification and comparison of physical evidence. Analysis, Identification and Comparison of the evidence is achieved through chemical, physical and biological test methods. These methods include visual and microscopic techniques, immunological tests, chemical solubilities and instrumental analysis. Interpreting the information contained within the evidence is accomplished through classification techniques.

In Forensic Science, materials may be classified based upon characteristic properties exhibited by those materials. There are two types of characteristics: ***Class Characteristics*** and ***Individualizing Characteristics***.

Class Characteristics are the properties that all the members of a certain class of objects or substances have in common. Evidence which exhibits class characteristics includes blood, hair, fibers, paint, glass, soil, etc. Materials which exhibit class characteristics cannot be identified as coming from one individual or source to the exclusion of all other similar sources. The evidentiary value of this type of evidence is based upon the probability factor.

Individualizing Characteristics refers to characteristics that render a particular sample as unique, even among members of the same class. Evidence which can exhibit individualizing characteristics includes fingerprints, firearms, impressions and physical or "jigsaw" matches. Unlike class characteristics, items which exhibit individualizing characteristics can be identified as originating from one single source.

HANDLING PHYSICAL EVIDENCE

The handling of physical evidence may be divided into five phases:

1. **Preservation and Documentation of the Crime Scene**
2. **Gathering all potential physical evidence**
3. **Marking the evidence correctly**
4. **Maintaining the chain of custody**
5. **Preventing contamination of the evidence.**

It is important to note that each phase is equally important if the evidence is to be accepted by the courts.

PRESERVATION AND DOCUMENTATION OF THE CRIME SCENE

The key to criminal investigation is the crime scene. Your responsibility as the field investigator is to preserve the integrity of the scene and to limit destruction or loss of evidence. In addition, particular attention should be paid to a detailed documentation of the scene. This documentation should include: a sketch specifying the location of all evidence, photographs of the evidence prior to collection and, if possible, a video walk through of the scene. The following are basic steps which should be followed in order to accurately preserve and document the crime scene:

1. **DO NOT RUSH!**
2. **Secure the scene;**
3. **Restrict entrance to the scene;**

   Only those individuals directly involved in the investigation should be granted access to the scene.
4. **Conduct an initial walk through of the scene, making mental notes of your observations. A video tape of the crime scene should be made at this time;**

5. **Construct a rough sketch showing the location of all pertinent physical evidence;**

6. **Prior to collection, photograph the location of all physical evidence as it appeared when found. A log of all photographs should be maintained for reference purposes.**

GATHERING ALL POTENTIAL PHYSICAL EVIDENCE

This is the most difficult phase of handling physical evidence. Difficult because each crime scene is unique and there are no set rules that cover all the possible evidence pertinent to that scene. Proficiency in this aspect comes from experience and "knowing what looks out of place". The possibilities are endless. It may be as simple as a cigarette butt in an ashtray to an over-turned table. Therefore, all potential physical evidence must be obtained. The smallest fiber could be the key to solving a crime. Such was the case in the infamous "Atlanta Child Murders" in the late 1970's and early 1980's.

An essential part of this case involved the association of fibrous debris removed from the bodies of 12 murder victims with objects from the everyday environment of the suspect, Wayne Williams. Before Wayne Williams became a suspect, the Georgia Crime Laboratory located a number of yellowish-green nylon fibers on the bodies and clothing of the murder victims. These fibers were very unusual in cross-sectional shape and consistent with being a carpet fiber.

In May of 1981, law enforcement officials were conducting surveillance on a bridge over the Chattahooche River in Atlanta. Around 2:00 a.m., a loud splash alerted the surveillance team to the presence of an automobile being driven slowly off the bridge. The driver of the vehicle was identified as Wayne Bertram Williams. Two days after Williams presence on the bridge, the nude body of Nathaniel Carter was pulled from the Chattahooche River, approximately one mile downstream from the bridge on which Wayne Williams was stopped. A yellowish-green nylon carpet type fiber was recovered from the head hair of Nathaniel Carter. A search warrant was issued for Williams' residence. An initial association of the fibers from Carter and other murder victims was made with a green carpet found in the home of Williams.

After examination at the F.B.I. Laboratory an apparent source of the yellowish-green nylon fibers had been found. Because of the unusual cross-sectional appearance of the nylon fiber and the difficulty in determining the manufacturer, it was believed that this was a relatively rare fiber. The investigator determined that this was, in fact, a rare fiber type.

Investigation revealed that this fiber type was manufactured for a one year period and that a total of 16,397 square yards of carpet containing this fiber type and dye color were produced. This amount is in comparison to the 6.7 billion sq. yards of estimated residential carpet floor space in the U.S. in 1979. Based upon probability determinations it was estimated that the chance of randomly selecting an occupied housing unit in the metropolitan Atlanta area having a carpet like William's was found to be 1 in 7,792 - a very low chance. Ultimately this evidence proved to be crucial in the conviction of Williams in the murder of 10 young boys.(5)

As this case shows, the importance of physical evidence must be stressed in its role at trial. In many cases eyewitness accounts are not available or reliable. Physical evidence may be the only mode of linking a suspect to one or a series of crimes. Therefore, as much evidence as possible must be obtained. "As an investigator, do not be too concerned with collecting too many physical items. The crime lab personnel can weed out the irrelevant ones. Without appropriate physical evidence, our effectiveness at the time of trial is severely diminished."(6)

MARKING THE EVIDENCE CORRECTLY

This phase of evidence handling is extremely important at the time of trial. When you are on the witness stand and are presented an exhibit, there are certain questions you must be able to answer. First, you must be able to *describe* the item. Second, you must be able to state *when* and *where* the item was collected. Finally, you must *identify* that item as the object which you collected. If you are unable to answer any of these questions, the judge may bar the item from being introduced as evidence.

Suppression of the evidence in this manner can be easily overcome by the proper labeling of the evidence. All collected evidence should be marked, either on its container or with evidence tags. The items should be labeled at the time of collection. All items submitted to the Crime Laboratory should contain the following information: *(See Figure 1.)*

1. **Assigned case number (if applicable);**
2. **Your name and/or initials;**
3. **A description of the item contained therein;**
4. **Location where the item was found; and**
5. **Time and date the item was collected**

The addition of these pieces of information will be of assistance to the crime lab personnel. It will also help prevent problems for yourself during trial.

NOTE:

For evidence collected by Maine State Police personnel, the evidence tag will be properly completed and attached to any item or its sealed container.

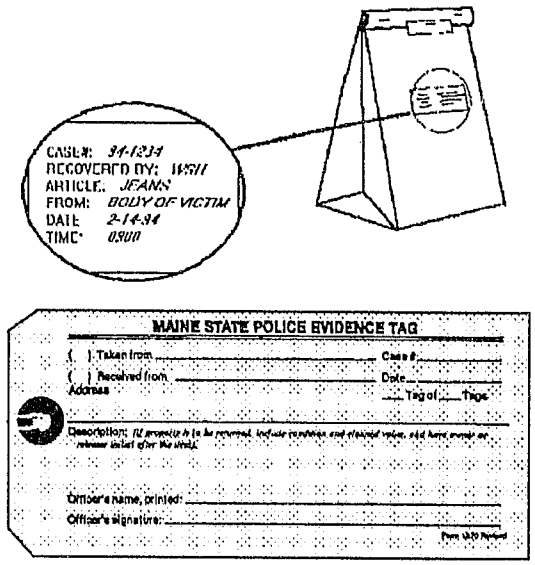


Figure 1.

MAINTAINING THE CHAIN OF CUSTODY

There are certain steps necessary to properly preserve the evidence so that it may be admissible at trial. At the time of collection, all evidence should be properly labeled and the containers sealed. Evidence should never be handled by a person(s) not connected with the case. This is done to avoid having to produce at trial numerous officers who might have handled the seized items.(7)

It is also recommended there be only one person who takes the article into their possession at the crime scene and the same individual turn the item over to the property clerk or crime laboratory personnel.(8) However, the use of an additional person(s) is acceptable in necessary situations. When turning over an item of evidence, the contributor should make sure the evidence or container has been previously marked with his/her name or initials and the date the item was received. A receipt for the item, which includes the date and time of transfer, name of the contributor and the signature of the recipient along with a description of the item, should be prepared. A copy of this receipt should be retained by each party for presentation at trial. **Document 1** is the evidence receipt currently in use by the Crime Laboratory.

MAINE STATE POLICE

Crime Laboratory
30 Hospital Street
Augusta, ME 04333-0133
Phone: 624-7017

EXAMINATION REQUEST/EVIDENCE RECEIPT

Primary Investigator:
Department:
Address:
Phone Number:
Delivered By:
Department:

Lab No.:
Case No.:
New Case ☐
Additional ☐
Page ____ of ____

Details of Case

VICTIM:
SUSPECT/DEFENDANT:
Complainant:
Brief Case History:

Type of Case:
Date of Incident:
Town or City:
County:

Date Received: Time Received: How Received:
By Whom:

Item #	Description of Item and Where Taken	Examination Requested

If these chain of custody procedures are followed, there should be little difficulty in showing that the article to be introduced into evidence is exactly the same article which was seized from the crime scene or from the suspect. Remember, "a chain with one broken link is often times worthless."

PREVENTING CONTAMINATION

This is the most important phase of handling physical evidence from the point of view of the crime laboratory. Preventing contamination of the evidence is accomplished in two ways:

1. **Proper handling**
2. **Proper packaging**

These procedures are outlined in the second part of this handbook and are essential if accurate results and interpretations are to be made.

Proper Handling

The first important aspect to collection is proper handling. **Never touch a blood or body fluid sample (wet or dry) with your bare hands**. Always wear LATEX gloves while handling evidence. In addition to protection against health hazards such as AIDS and Hepatitis, gloves will protect against contamination of the

sample which may result from handling. Approximately 80% of the population are **secretors**. A **secretor** is an individual whose body fluids (ie; semen, sweat, saliva, etc.) contain certain antigens which directly reflect that individual's ABO blood type. For example, if you have type "A" blood and you are a secretor, forensic tests will, in most cases, be able to detect the "A" antigen (or blood group substance) in a sample of your saliva.

The following is an example of how improper handling could effect the interpretation of laboratory tests:

Blood was found from a victim with type "O" blood at the scene of a homicide. The blood was collected by the swatch method which will be described later. If, after drying, an officer (who is blood type "A" and a secretor) were to handle the swatch with a bare hand, the officer's blood type could be expressed in the criminalist's test results. Therefore, when the interpretation of the results are made, it would appear that the blood is a mixture of both "A" and "O" type blood, not consistent with the victim's blood alone. This could have dramatic effects on the investigation and possibly the prosecution of the case.

Although this example deals specifically with blood, it should be noted that this problem of contamination applies to body fluid evidence as well.

Proper Packaging

Blood and Body Fluids:

Proper packaging of evidence is crucial, particularly when the evidence involves blood or body fluids. Blood and body fluids are excellent growing media for bacteria. Blood is even used in hospitals as growing media for cultures. Therefore, the possibility of contamination is high if the evidence is not properly packaged. This type of stained evidence should never be packaged as a wet sample. **Allow the sample to air dry prior to packaging and submittal to the crime laboratory**. Once the sample is dry, place it into a paper bag. **NEVER USE PLASTIC BAGS**. Plastic bags hold moisture, which promotes the growth of bacteria. These bacteria may produce antigenic substances similar to those which the criminalist "types" in the laboratory. The bacteria may also destroy the antigenic substances originally present in the sample. This could lead to improper or unobtainable lab results. **REMEMBER: "Plastic is your enemy - BROWN PAPER IS YOUR FRIEND!"**

If wet blood is found on a surface other than one which is porous such as a tile floor, collection should be done with a small piece of sterilized cotton cloth. Allow the cloth to soak up the blood and then air dry. Whole blood samples collected from a victim or suspect should be delivered to the crime laboratory immediately

or **refrigerated** until delivered. In the event that evidence is delivered to the laboratory "after hours", the evidence may be placed in one of the evidence lockers located on the bottom floor of the Crime Laboratory. A key to gain access to these lockers is available through the Regional Communications Center at State Police Headquarters. **Please return the key when finished.** Evidence Locker #2 is equipped with a refrigerator for storage of blood and other perishable materials. Evidence lockers 1, 3 and 4 may be used to air dry clothing or other articles which are wet with blood, water or body fluids.

Trace Evidence:

"Trace evidence" (ie; hair, fibers, paint, glass, etc.) must also be carefully packaged. It is recommended that such evidence **not be** placed directly into envelopes or plastic bags. The problem with the use of envelopes is they do not seal completely. The glue does not extend to the corners of the envelope, thereby allowing the contents to "leak" out of the package. Plastic bags pose a different problem to the criminalist. Due to static build-up within the bag, the evidence can adhere to the inside surfaces, making it difficult to remove and handle the sample.(9)

Therefore, it is requested that all trace evidence be packaged in a *"druggist fold"*. **Figure 2** explains how to make a druggist fold out of a piece of paper. After

packaging in a druggist fold, the evidence should then be placed into an envelope for proper labeling and additional protection.

The Druggist Fold

DIRECTIONS:

1. *Place the article of evidence in the center of paper.*
2. *Fold paper lengthwise twice in non-parallel folds so that the flaps overlap.*
3. *Fold over ends tucking the smaller end inside of the larger end.*
4. *Place the resultant packet in a conventional envelope and seal.*

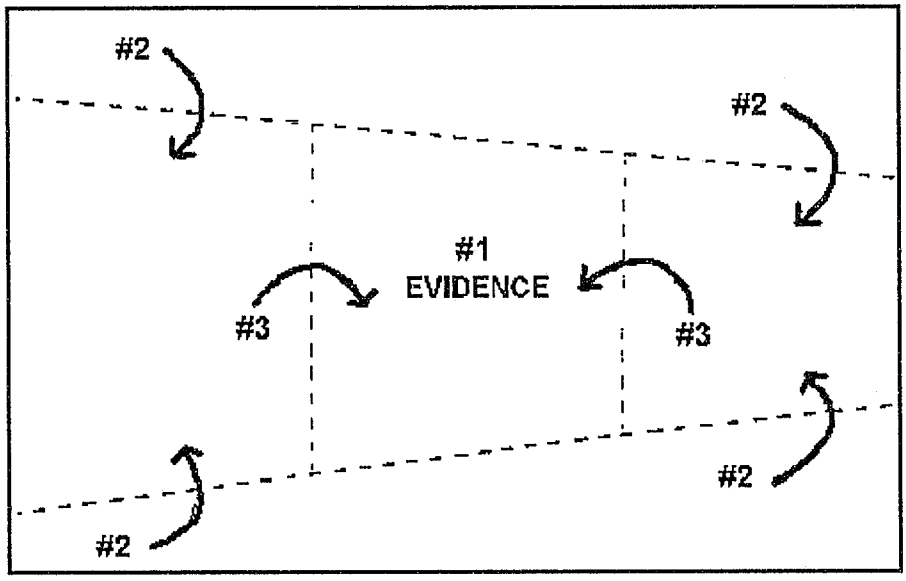


Figure 2.

Fingerprint Examination:

In collecting physical evidence for *fingerprint examination*, the officer should concentrate recovery efforts on the point of entry, the object of attack, the path of contamination and the point of exit. It is essential during the collection of physical evidence that every item collected be properly identified and packaged in a proper container. The container of each item collected should be marked with the case number, date, time and the collecting officer's initials. When it is not practical to place the collected item in a container, the item should have an identification tag containing the required information. When it is necessary to place identifying marks on an item, extreme caution should be exercised. Identifying marks should not be placed where they will adversely affect proper analysis or examination. If in doubt DO NOT MARK THE ITEM, AFFIX AN EVIDENCE TAG CONTAINING THE APPROPRIATE INFORMATION.

Any items being collected for submission to the Crime Laboratory must be properly handled and packaged to prevent the destruction of any latent fingerprints while in transit. Evidence possibly bearing latent fingerprints **must** be kept separate and not permitted to rub against other items of evidence or against the side of the container. Evidence bearing fingerprints should **NOT** be wrapped in plastic bags, cloth, or towels nor handled excessively.

In the case of a fixed or immovable object or when it is not practical to transport an item to the Crime Laboratory, the item may be processed in place for fingerprint impressions utilizing accepted fingerprint development methods. Fingerprints collected in this manner should be photographed with and without a scale and, if possible, lifted. Any developed fingerprint lifts should then be marked with the required case information. A sketch should also be made depicting the location of any fingerprints developed. Most of the latent fingerprint development techniques available to officers in the field (such as fingerprint powder) are generally effective only on objects of a non-porous nature such as glass, hard plastics, and metal. Items which are porous in nature such as paper, leather, styrofoam or unfinished wood should not be examined by these methods. These items should be transported to the Crime Laboratory for analysis.

The following methods are suggested for handling items which are to be transported to the Crime laboratory for latent fingerprint examination.

1. Time is a major factor regarding latent fingerprint impressions, particularly on items of a non-porous nature. Latent fingerprint impressions are usually deposited on an item by means of a transfer medium such as sweat. Under low humidity conditions or lengthy time periods, the latent fingerprints can lose critical detail by evaporation. Therefore, it is important to transport fingerprint

evidence to the Crime Laboratory as soon as possible and to prevent exposure of the evidence to extremes in temperature.

2. Latent fingerprints located on non-porous items are the most vulnerable to being damaged during handling and transport. Items which have been dusted for fingerprints prior to transport should have any developed fingerprints covered by lifting tape to protect them.

3. An officer should always note and mark the area of an item or fingerprint lift which was handled in such a way that their own fingerprints may be present. The Crime Laboratory should be advised of these possible contaminated areas.

Firearms Identification:

Firearms Identification involves the comparison of microscopic marks appearing on the surfaces of all fired bullets, cartridge casings and shot shell casings. Based upon these microscopic characteristics, a trained firearms examiner can identify or exclude a spent bullet or casing as having been fired by a particular firearm. Before collecting any firearm which might be sent to the Crime Laboratory, the investigator should note the following information:

1. Position of the hammer (if the weapon has an exposed one) record whether the hammer is down, half cocked or cocked.
2. Position of the safety: on/off
3. DO NOT OPEN THE FIREARM*. Note the position of the safety. Put safety on if you determine it is necessary.
4. Note the position of the choke setting in the case of an adjustable shotgun choke.
5. Note the power setting on adjustable and battery operated scopes.

* Firearms which will not be sent to the Crime Laboratory should be checked on scene.

Firearms should be picked up with care in order to preserve fingerprints or other trace evidence which may be present on the item. **DO NOT PLACE ANY OBJECTS IN THE BARREL OF THE WEAPON. Complete an "evidence tag" with the following information:** Condition of weapon (ie; LOADED/UNLOADED/ POSSIBLY LOADED, SAFETY ON/OFF), date, time when collected, location where found, your name and/or initials. Affix evidence tag and forward to the Crime Laboratory.

The microscopic markings found on bullets and casings are very fine and delicate. Therefore, extreme care should be taken when handling bullets and casings to preserve these microscopic markings. Spent rounds should be picked up with

a gloved hand. **DO NOT MARK ITEM.** Package each round separately in a plastic or cardboard container. Seal and label the container. Rounds of ammunition should be picked up with a gloved hand. **DO NOT MARK THE ITEM.** Package separately in a plastic or cardboard container. Seal and label the container.

Tool Mark Identification:

The basic principles of *Tool Mark Identification* are similar to Firearms Identification. Microscopic imperfections present on a tool are transferred to the surface of another item during forceful contact. Based upon these microscopic characteristics, a trained examiner can identify or exclude a particular tool as the source of the tool mark.

Items being collected for tool mark identification and comparison must be picked up with care in order to preserve the microscopic markings present on the surfaces. Cover the area containing the tool mark with soft paper to avoid damage to the marks and to preserve trace evidence such as fingerprints, blood and paint. Place evidence in a cardboard box. Seal and label the container.

This section of the manual provides collection and preservation techniques designed for proper packaging of various types of physical evidence. As stated in the introduction of this manual, these collection protocols are intended as a general guide outlining necessary and efficient methods for dealing with physical evidence. If additional technical information is required please contact the appropriate personnel at the Crime Laboratory.

BLOODSTAIN PATTERNS

Bloodstain patterns can sometimes provide information concerning the possible actions which caused the patterns. In most cases, photographs are sufficient for interpreting patterns. Therefore, precise photographic techniques must be used in order to allow proper interpretation of bloodstain patterns.

Photographing Bloodstains:

1. All bloodstains which appear to have resulted from beating, kicking, splashing, wiping, shooting, etc., should be photographed in color and printed in 8 x 10 print size.
2. A sketch of the crime scene should be submitted indicating the location of each individual photograph.

3. All photographs should be taken 90° (perpendicular) to the stained surface.

4. A scale (ruler) must be included in each photograph.

5. Overall photographs of the bloodstained area should be submitted. These photographs should contain a vertical scale extending from a reference point such as the floor and a horizontal scale extending from another reference point such as the edge of a wall. Seamstress tape measures with large numbers should be used for this purpose.

6. Representative stains and control samples should be collected for laboratory testing. Identify these stains by circling and labeling prior to photographing.

7. Close-up photographs of bloodstained areas should also be taken. Include a scale in each photograph.

BLOOD AND BODY FLUIDS

(Photograph all stains with scale prior to collection.)	
IMMOVABLE OBJECTS	**COLLECTION TECHNIQUE**
Dried Stains	**1. Cut sterile cotton swatch* to approx. 1/2 size of stain;** **2. Moisten swatch with distilled water;** **3. Extract stain onto swatch (as concentrated/dark as possible); and** **4. Place swatch onto glass slide and label the slide.** **5. Allow to air dry prior to packaging.** **6. Label package.** **7. Clean forceps with alcohol between samples.** **8. Submit sample of unstained cotton swatch moistened with distilled water only as a control.** *** Maximum size of swatch approx. the size of a fifty cent piece**
Liquid samples	**Same as above, skipping step 2.**
MOVABLE OBJECTS	**COLLECTION TECHNIQUE:**
Allow stains to air-dry.	**Place item in clean paper bag, DO NOT USE PLASTIC BAGS. Place each item in a separate bag. Seal and label bags.**

CLOTHING

Avoid shaking out the item during packaging. If trace evidence is present which could be easily lost, remove and package separately in a druggist fold. For items wet with blood or body fluids, air dry at room temperature prior to

packaging. Place item in a separate clean paper bag, DO NOT USE PLASTIC BAGS. Seal and label bags.

HAIRS AND FIBERS

Place samples in paper folded into a druggist fold. (SEE PART I - PAGE 18) Place paper into envelope and seal. Label envelope.

GLASS

If possible, label glass "inside"/"outside". Package in paper, taking care to protect broken edges in case it is possible to make a physical match. Place wrapped glass in a solid protective container. Seal and label container.

PAINT

Handle as hairs and fibers, If chips are large and a physical match is possible, the chips must be protected by placing them in a pill box or other protective container. For cases involving smears, scrape smeared area with scalpel and place scrapings in druggist fold. Seal and label the container.

MISCELLANEOUS TRACE EVIDENCE

Handle as hairs and fibers.

KNOWN SAMPLES (STANDARDS)

Suspect's and victim's standards should be obtained as soon as possible. Known samples of material present at the crime scene should also be collected and submitted to the Crime Laboratory. See Table 3.

TABLE 3. COLLECTION OF KNOWN SAMPLES

SAMPLE	COLLECTION TECHNIQUE
BLOOD	Collect blood in one red top tube (no additives or gel) and one purple top tube with preservative (EDTA). Label tubes, seal in separate envelopes and label envelopes. Refrigerate sample until transport to Crime Lab. DO NOT FREEZE SAMPLE or EXPOSE TO HIGH TEMPERATURES.
SALIVA	Be sure individual has not eaten, drunk or smoked for one-half hour prior to collection of sample. Have individual spit into center of filter paper. Allow to AIR DRY. Seal in envelope with tape (DO NOT LICK ENVELOPE).
HAIRS (head)	Pull twelve representative hairs from each of five different areas of head (front, top, back, left side and right side). Place hairs into a druggist fold. Place druggist fold in an envelope, seal and label.
HAIRS (pubic)	Pull twelve representative hairs from different areas of the pubic region. Fold hairs in paper towel. Place paper towel in an envelope, seal and label.
PAINT, SOIL, AND GLASS	Collect from an area directly adjacent to area of interest. Package in same manner as previously described.

FINGERPRINTS

There are numerous ways to package and handle items of fingerprint evidence and no one given method can cover every situation. Figures 3 through 7 present some suggestions on handling and packaging items of fingerprint evidence for transport to the Crime Laboratory.

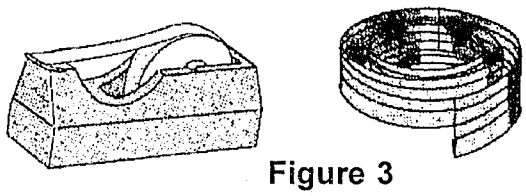


Figure 3

Adhesive Tape

If the tape is wadded **DO NOT** attempt to unravel. The tape may be mounted to a sheet of cellophane or wax paper to prevent the adhesive from sticking to another surface. Care must be taken not to damage the ends of the tape in order to allow their use for possible physical matching.

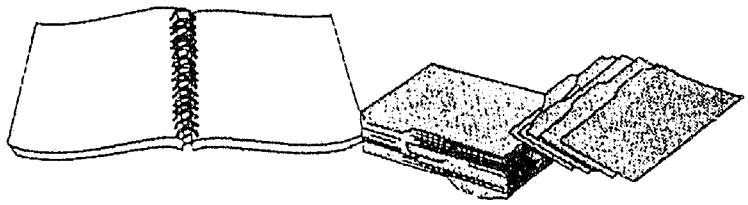


Figure 4

Paper Products

Paper products such as checks, cardboard, currency, newspaper etc. may be enclosed in a folder or carton for protection. Any paper products collected should be kept dry and should not be folded or bent. Laboratory personnel should be advised of any documents which are of value and are not to be altered or damaged. Paper items submitted to the Crime Laboratory for examination of obliterated, eradicated or indented writing should be handled in

the same manner. Anonymous letters or extortion letters should be handled and packaged in the same manner as paper items for fingerprint examination.

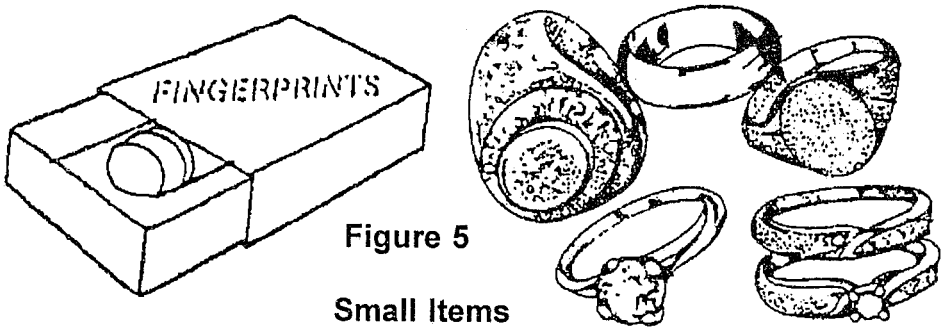


Figure 5

Small Items

Small items such as glass, cigarette butts, jewelry etc. may be placed in small boxes or vials such as film canisters. The items should **NOT** be wrapped in cotton or paper when packaged. The small containers should then be secured in a larger package to reduce the chance of the evidence being rubbed or wiped in its container. Items should be handled by their edges or in areas less likely to bear latent fingerprint impressions.

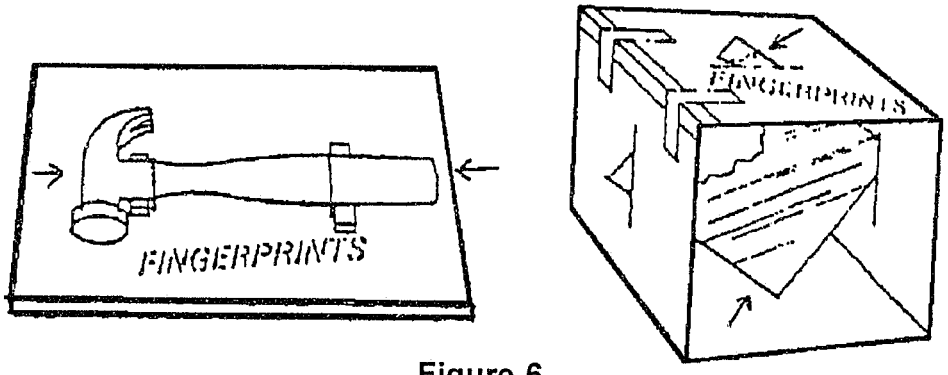


Figure 6

Medium Sized Items

Medium sized objects may be mounted on a flat piece of ridged cardboard or wood which is wired into a container or wedged so it is prevented from rubbing against other items or the sides of the container. Items should be handled by their edges or in areas less likely to bear latent fingerprint impressions.

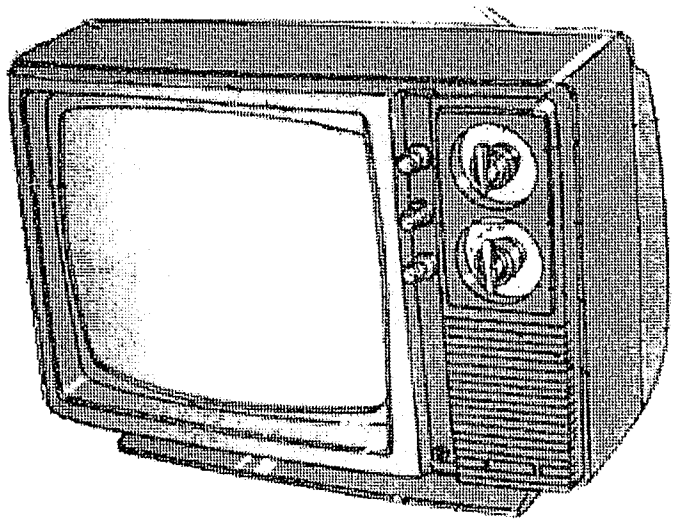


Figure 7

Large Items

Large items may be placed in individual crates or taped to a flat piece of rigid cardboard or wood. Spacers should be placed under the item to protect the undersurface from rubbing during transport. Large objects should be handled by their corners or in areas less likely to bear latent fingerprint impressions.

FOOTWEAR AND TIRE IMPRESSIONS

This section is included to ensure the proper handling, packaging and transportation of physical evidence to be submitted to the Crime Laboratory for footwear or tire impression analysis. In collecting physical evidence for footwear/tire impression examinations, the officer should assess the scene to determine the point of entry, path of contamination and point of exit. Particular care should be taken to avoid possible eradication of impressions by officers and vehicles approaching the scene.

In many instances it is neither possible nor practical to collect the actual footwear/tire impressions found at a scene. Therefore, an officer should process the impression(s) in place while utilizing accepted methods of recording the impressions. Photographs should always be taken **prior** to collecting footwear/tire impressions.

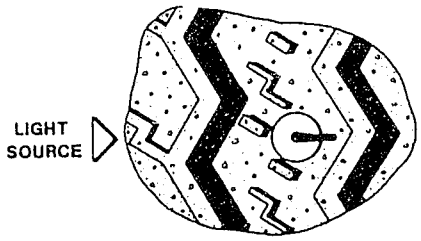
Basic rules for photographing footwear and tire impressions

1. The film plane and lens should be directly over and parallel to the impression.
2. Photographs of the impressions should be taken using black and white film.

3. Photographs of the impressions should be taken with and without a scale (ruler).

4. Even in daylight, photographs of impressions should be taken with and without a flash in order to highlight shadowed areas. This is critical for three dimensional impressions prior to their being cast. Photograph the impression with the flash at an oblique angle (side lighting) to the impression. See Figure 8. Repeat this step four times, placing the flash on all four sides of the impression.

Figure 8



Two dimensional footwear and tire impressions:

1. These impressions should be collected in a manner similar to latent fingerprint evidence. An item such as a sheet of paper or piece of glass bearing an impression should be packaged in such a way as to prevent the impression from being rubbed.

2. An impression on a surface such as a tiled floor may be dusted using fingerprint powder and then lifted.

3. A two dimensional impression on a dusty surface (where the use of dusting would wipe away the impression) can be lifted by placing a sheet of carbon paper over the impression followed by

running a fingerprint inking roller over the imprint. The transferred impression is then packaged to prevent rubbing.

Three dimensional footwear and tire impressions:

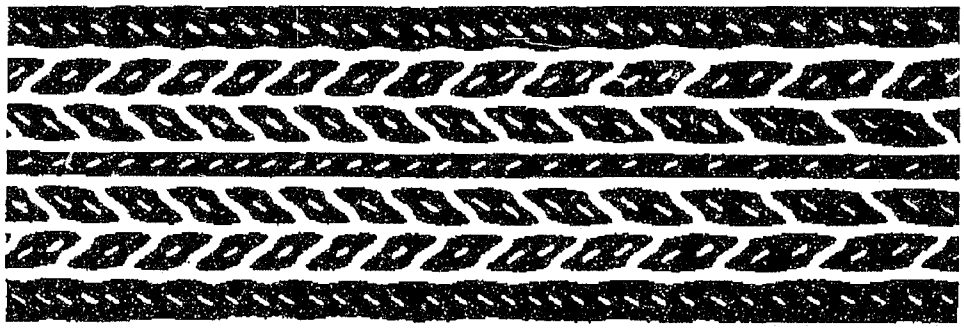
1. These types of impressions are collected using casting techniques. In preparing a three dimensional impression for casting, twigs, leaves or stones from the peripheral area which will interfere with the placement of a retainer wall and any foreign objects which may have blown or fallen into the impression should be removed.
2. The casting material being used to record the impression should be mixed according to directions.
3. When pouring the casting material, great care must be taken not to damage the impression. The casting medium should be poured over a large spoon or putty knife while directing the flow evenly around the impression.
4. As the casting material dries, the officer should record identification marks on the back of the cast before it completely hardens.

5. When the cast has completely dried it should be lifted and suitably packaged to prevent its breakage. **DO NOT** attempt to clean the cast.

Collection of suspect footwear and tire impressions

1. Suspect footwear should be dried and then packaged in such a manner as to avoid causing damage to the soles which may add to or affect any accidental characteristics present.
2. The information on the sidewall of a suspect tire should be recorded by the officer.
3. Tire tread impressions from a suspect vehicle can be recorded by the following procedure:
   A. Wipe the tread surface of the tire(s) clean with a rag and then rub a light coating of oil over the surface of the tread.
   B. Place a sufficient length of paper or cardboard in front of the prepared tire and roll the vehicle across the surface of the paper. The sidewall of the tire should be marked so a complete rotation of the tire is recorded.
   C. When the rolling is completed, the surface of the paper or cardboard may then be dusted with fingerprint powder.

D. After the suspect tire test impressions are recorded, the officer should mark the edge of the paper with his/her name, case number, date, time, which tire of the vehicle was recorded, which side of the test impression is the outside edge of the tire and an arrow to indicate the direction the tire was rolled across the paper. See Figure 9.



Right front tire-outside edge ⟶

Figure 9

4. Test impressions of the four mounted tires and the spare tire should be recorded. Front and rear track (distance between wheels on the same axle) and the wheelbase dimensions of the suspect vehicle should also be recorded.

FIREARMS EVIDENCE

Before collecting any firearm, the investigator should note the following information:

1. Position of the hammer (if the weapon has an exposed one). Record whether the hammer is down, half cocked or cocked.
2. Position of the safety: on/off
3. **DO NOT OPEN THE FIREARM*.** Note the position of the safety. Put safety on if you determine it is necessary.
4. Note the position of the choke setting in the case of an adjustable shotgun choke.
5. Note the power setting on adjustable and battery operated scopes.

* Firearms which will not be sent to the Crime Laboratory should be checked on scene.

Firearms should be picked up with care in order to preserve fingerprints or other trace evidence which may be present on the item. **DO NOT PLACE ANY OBJECTS IN THE BARREL OF THE WEAPON.** Complete an "*evidence tag*" with proper information including the following information: condition of weapon (LOADED/UNLOADED/POSSIBLY LOADED, SAFETY ON/OFF), other vital information (Manufacturer, serial number, caliber, etc.).

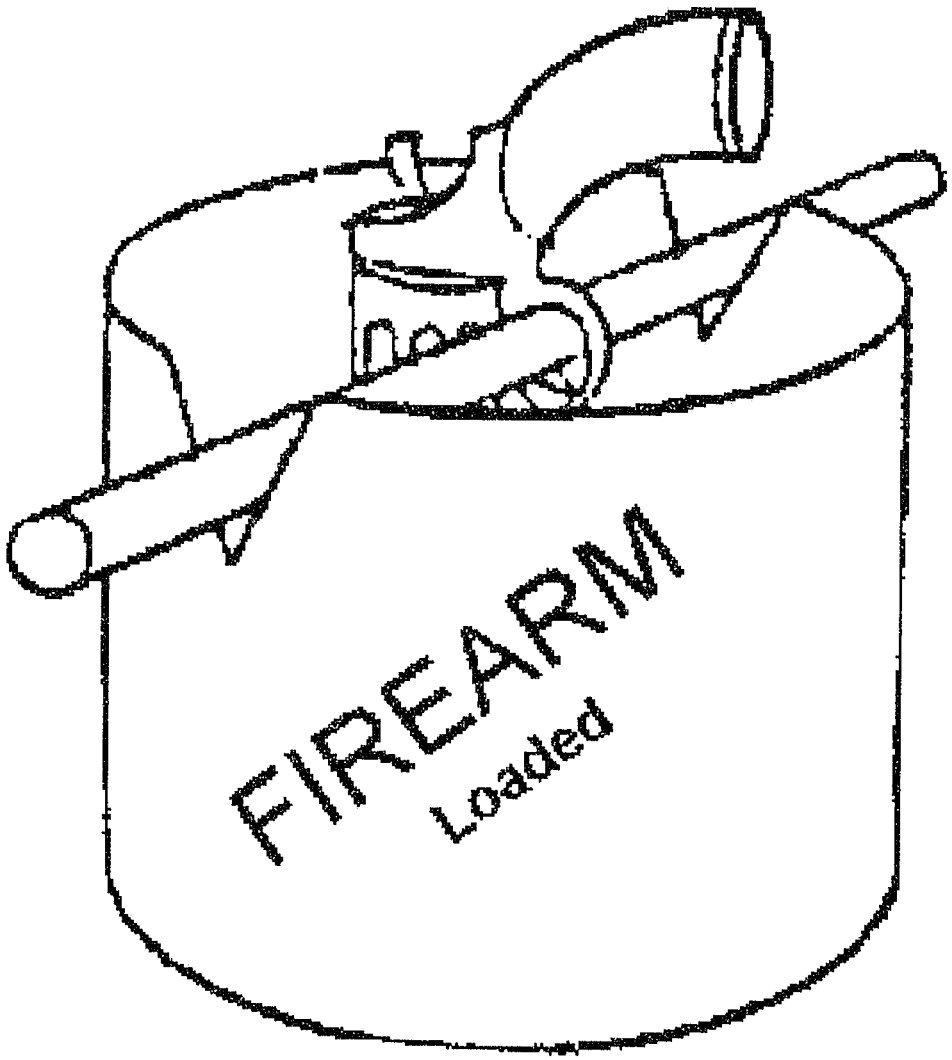


Figure 10

Handgun

A handgun may be suspended in a can, small box or cut down plastic jug by placing a wire or stick through the trigger guard **BEHIND THE TRIGGER. INDICATE IF THE WEAPON IS LOADED OR UNLOADED ON THE SIDE OF THE CONTAINER.**

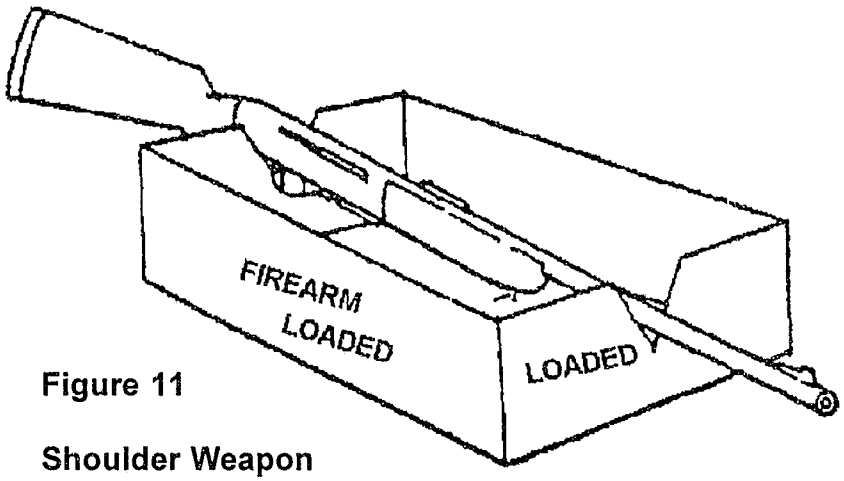


Figure 11

Shoulder Weapon

A shoulder weapon may be cradled in a suitable cardboard box. **INDICATE IF THE WEAPON IS LOADED OR UNLOADED ON THE SIDE OF THE CONTAINER.** When handling a shoulder weapon, use the sides of the trigger guard or sling if attached.

Bullets and Casings

Spent bullets and casings: **DO NOT MARK ITEM.** Pick up item with a gloved hand. Package separately in a plastic or cardboard container. Seal and label the container.

Rounds of ammunition: **DO NOT MARK ITEM.** Pick up item with a gloved hand. Package separately in a plastic or cardboard container. Seal and label the container.

TOOL MARKS

Cover tool mark with soft paper to avoid damage to the mark or loss of other evidence. Place evidence in a cardboard box. Seal and label container.

TOOLS

Cover surface with soft paper. Immobilize item. Place in paper bag or cardboard container. Seal and label the container.

PHOTOGRAPHY

OPERATION OF THE DEPARTMENT NIKON CAMERAS

There are two types of Nikons in service at this time. The Nikon FM is the most prevalent while the second type is the Nikkormat EL.

Loading of film

1. Pull up on the rewind crank after pushing the safety knob to the side. The safety knob is located directly adjacent to the rewind

knob. Place the film cartridge in the empty chamber, being sure it is inserted fully.

2. Push the rewind knob back into position. If resistance is felt, rotate the rewind knob while pusning down until it seats into place.

3. Pull the leader of the film out of the cartridge and insert it into the slot of the take up spool on the other side of the camera. Be very sure that the leader is pushed in as far as it will go into this slot. Turn the take-up spool by the thumb wheel one full turn to be sure the film remains in the slot. Check to be sure the film perforations engage the toothed wheel of the metering roller.

4. Close the camera back.

5. Advance the film to exposure #1. While advancing the film, be sure to watch the rewind knob. It should be turning in the opposite direction of the engraved arrow. This indicates that the film is moving through the camera properly and is the **only** indicator you have that all is well.

Determining the correct exposure

The correct exposure is determined by the following steps:

NIKON FM

1. Check to see that the correct ASA number is set in the ASA window which is in the center of the shutter speed dial. To change it, lift the rim of the shutter speed dial and turn. Be sure the rim locks into place when released. Refer to film box for correct ASA number.

2. Turn on exposure meter by pulling the film advance lever out from the camera body until an engraved red dot is exposed on camera body.

3. Set the shutter speed dial to 125.

4. At the far right of the viewfinder, there will be a glowing red LED, and three positions + O -. Turn the lens aperture ring until the O lights up.

5. If the lens aperture ring will not turn far enough to cause the O to light up, it is necessary to use a flash.

NIKKORMAT EL

1. Check to see that the correct ASA number is set in the ring around the rewind knob. To change it, push in on the silver lock and rotate the silver ring. Be sure the indicator locks into place. Refer to film box for correct ASA number.

2. Turn on exposure meter by pulling the film advance lever out from the camera body until an engraved red dot is exposed on camera body.

3. Set shutter speed to 125. It may be necessary to push button down in center of shutter speed dial to release it.

4. At the far left of viewfinder, there will be a column of numbers. Over this column is a green bar and a black needle. To set the exposure, turn the lens aperture ring until the black needle covers the green bar.

5. If the lens aperture ring will not turn far enough to cause the black needle to cover the green bar, it is necessary to use a flash.

Removal of film

When the exposures in the film are used up, push the film release button on the bottom of the camera and rewind the film. Be sure to turn the rewind crank in the direction of the engraved arrow only or the film will have stress streaks or lines after it is developed. In cold weather, rewind the film slowly to prevent breaking of the film.

Flash photography

When using flash with either camera, be sure shutter speed dial is set at 125. Set the ASA setting on the flash to the correct number for the film being used, usually 100. Set the lens aperture on the camera lens to the one indicated on the flash unit guide.

The Crime Laboratory Examination Request/Evidence Receipt is designed to provide the Maine State Police Crime Laboratory with:

1. A permanent record of physical evidence sent to the facility.
2. Information regarding the type of examination, test or analysis requested to be performed on the evidence.
3. Provide the officer submitting physical evidence to the Crime Laboratory with a receipt and an inventory of the items submitted.

The Crime Laboratory Examination Request/Evidence Receipt shall be made out in all cases where physical evidence is submitted to the Crime Laboratory. The Examination Request/Evidence Receipt shall **accompany** any physical evidence sent to the Crime Laboratory by **Registered or Certified Mail**.

MAINE STATE POLICE

Crime Laboratory
30 Hospital Street
Augusta, ME 04333-0133
Phone: 624-7017

EXAMINATION REQUEST/EVIDENCE RECEIPT

Primary Investigator:
Department:
Address:
Phone Number:
Delivered By:
Department:

Lab No.:
Case No.:
New Case ☐
Additional ☐
Page ____ of ____

Details of Case

VICTIM:
SUSPECT/DEFENDANT:
Complainant:
Brief Case History:

Type of Case:
Date of Incident:
Town or City:
County:

Date Received: Time Received: How Received:
By Whom:

Item #	Description of Item and Where Taken	Examination Requested

Completion of the Examination Request/Evidence Receipt form:

1. **Primary Investigator:** the officer responsible for the investigation of the case. Examination results will be forwarded to the Primary Investigator.
2. **Department:** the Troop or Division to which the Primary Investigator is assigned.
3. **Address:** the location where laboratory reports are to be sent.
4. **Phone Number:** the telephone number of the Primary Investigator.
5. **Delivered By:** the person or carrier who delivers the evidence to the Crime Laboratory.
6. **Department:** the Troop, Division or agency of the person delivering the evidence to the Crime Laboratory.
7. **Lab No.:** the number assigned to the case by the Crime Laboratory at the time of delivery. This number shall be referred to for any inquiries to the Crime Laboratory regarding the case.
8. **Case No.:** the number assigned to the case by the Troop, Division or Agency (Example: BC90-1234).
9. **New Case:** the block checked by the Crime Laboratory to indicate that the evidence being submitted is not part of a previously submitted case.

10. **Additional:** the block checked by the Crime Laboratory to indicate the evidence being submitted is part of an existing case.

11. **Page: of: :** the number of pages of Examination Request/Evidence Receipt Forms being filled out at the time of evidence submission.

12. **Victim:** the victim in the case and shall be entered as a person's name or as the name of a business.

13. **Suspect/Defendant:** the name(s) of any suspects or defendants along with their dates of birth, if known.

14. **Complainant:** the name of the person who reported the offense or incident being investigated.

15. **Brief Case History:** a brief description of the offense/incident being investigated, the condition of the evidence being submitted and/or any other extenuating circumstances which may be helpful to Crime Laboratory personnel.

16. **Type of Case:** the nature of the offense or incident under investigation.

17. **Date of Incident:** the date the offense or incident being investigated occurred or was reported.

18. **Town or City:** the municipality or civil division where the offense/incident being investigated occurred.

19. **County:** the county of the municipality or civil division where the offense/incident being investigated occurred.

20. **Date Received:** is recorded by the Crime Laboratory when the evidence is received.

21. **Time Received:** is recorded by the Crime Laboratory when the evidence is received.

22. **How Received:** is recorded by the Crime Laboratory when evidence is received to indicate the method used to transport the evidence to the Crime Laboratory. (example: Certified Mail, In Hand, etc.)

23. **By Whom:** the member of the Crime Laboratory who receives the submitted evidence will record their signature in this section.

24. **Item #:** the evidence control number assigned to each item of evidence.

25. **Description of Item and Where Taken:** a brief description of each item of evidence and from who/where the item was seized.

26. **Examination Requested**: the type of examination(s) requested for each item of evidence.

In the science of forensics, various techniques and instruments are utilized in order to analyze, identify and compare physical evidence. This portion of the manual is intended as a brief synopsis of procedures and instruments used in the analysis of physical evidence.

PROCEDURES USED IN THE ANALYSIS OF PHYSICAL EVIDENCE

Blood

In the forensic laboratory the **identification** of blood is achieved through a series of tests.

Step 1. Presumptive test: Used as a screening method to determine if a suspected stain could be blood.

Step 2. Confirmatory test: Conclusively identifies a stain as containing blood.

Step 3. Species test: Determines the species of origin of the blood-stain.

Further **characterization** and **comparison** of blood samples is accomplished through:

1. ABO typing
2. Red blood cell isoenzyme typing (electrophoresis)
3. DNA analysis

Semen

The **identification** of semen is accomplished through a series of testing methods. The first series of tests, called **presumptive tests**, detect the presence of the following substances:

1. Acid Phosphatase: An enzyme present in high concentrations in semen. However, acid phosphatase is present in lower concentrations in non-seminal body fluids.
2. Choline: A by-product which results during the drying of semen. This component is not semen specific.

Tests which positively identify the presence of semen, called **confirmatory tests**, are based upon detection of one of the following:

Sperm cells: Sample is microscopically examined for the presence of sperm cells. Only semen contains sperm cells. In this test method the morphology of the sperm cells is important for determining the species of origin.

(P30): In instances when sperm cells cannot be isolated, the forensic laboratory will test for the presence of a prostate specific antigen, called P30, which is found in detectable quantities only in semen.

The **Association** of a semen stain to a suspect is conducted based upon:

1. Secretor status
2. ABO blood type
3. Isoenzyme types
3. DNA analysis

Hair

A hair is composed primarily of a protein called keratin and consists of three morphological regions: The **cuticle, cortex** and **medulla**. (See Figure 12). There are a number of determinations which can be microscopically concluded as to the origin of a hair: **animal or human origin, body origin** (mainly head or pubic), **racial origin** (Caucasian, Negroid, oriental/American Indian) and how the hair was removed (shed naturally or forcefully removed).

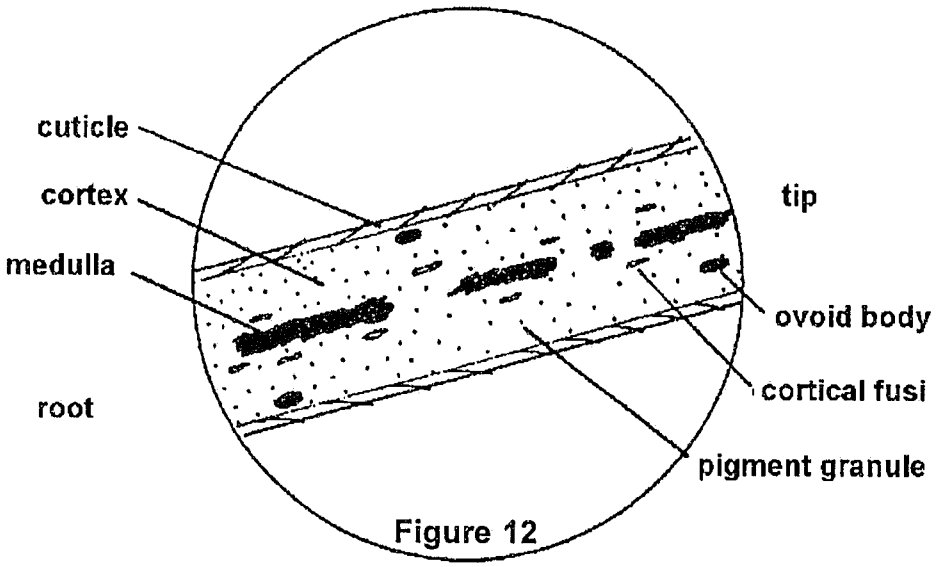


Figure 12

The conclusions which can be made based upon hair **comparison results** are:

1. Microscopically similar: The questioned hair could have originated from a particular person.
2. Microscopically dissimilar: It is possible to exclude a person as a source of a particular hair.
3. Inconclusive: It is not possible for the examiner to reach a conclusion as to whether or not a hair could have originated from a particular person.

It must be noted, **PERSONAL IDENTITY CANNOT BE ESTABLISHED BASED UPON HAIR COMPARISONS**.

Fibers

Fibers can be divided into four main groups:

1. Animal: (wool, rabbit, etc.)
2. Vegetable: (cotton, flax, etc.)
3. Mineral: (fiberglass, asbestos, etc.)
4. Synthetic: (polyester, nylon, etc.)

Identification and comparison of fibers is achieved through solubility tests, measurements of optical properties, determination of chemical composition, and comparison of dye components.

Fingerprints

There are ten basic fingerprint patterns. (see Figure 13) Contained within these patterns are **ridge characteristics** which have certain peculiarities. These peculiarities are referred to as: *islands, lakes, bifurcations* and *ridge endings*. The fingerprint examiner, with the aid of a magnifying glass, determines the location and type of characteristics present in a latent fingerprint. The examiner then compares these peculiarities to the peculiarities present in the inked impressions on a suspect's fingerprint card in order to determine if they are of the same origin.

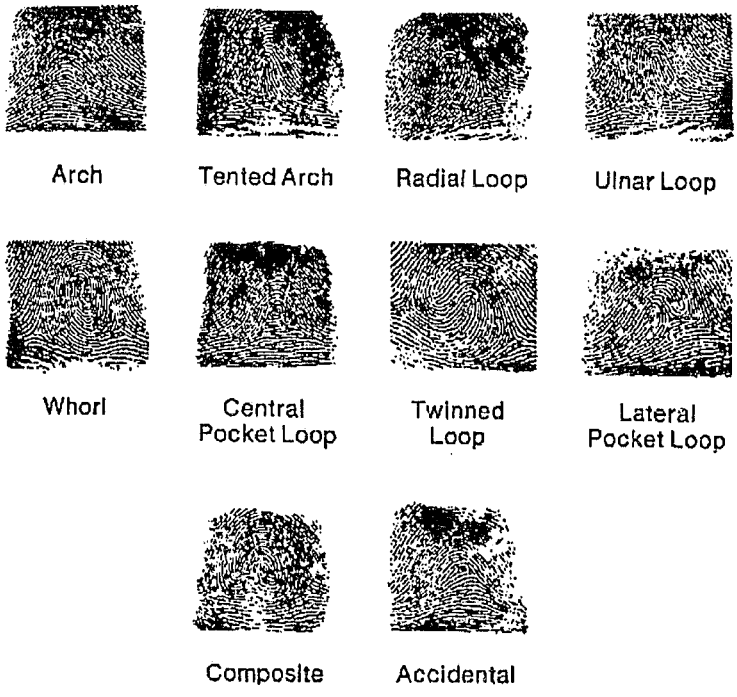


Figure 13

Basic Fingerprint Patterns

Firearms

When a round of ammunition is loaded into a firearm and detonated, the class characteristics of that firearm are placed onto the spent bullet and cartridge casing. The class characteristics placed on a spent bullet would be the rifling information which includes the number of lands and grooves and their widths, the direction of twist and its rate. Class characteristics for the cartridge casing would be the type and size of firing pin, location of the extractor and ejector.

NOTE: By combining the rifling information (by caliber), the type of firearm used to fire these components can frequently be determined.

Individual characteristics found on spent bullets and cartridge casing originate from manufacturing and are used to determine whether a particular bullet or cartridge casing was fired by a particular firearm to the exclusion of any other firearm in the world.

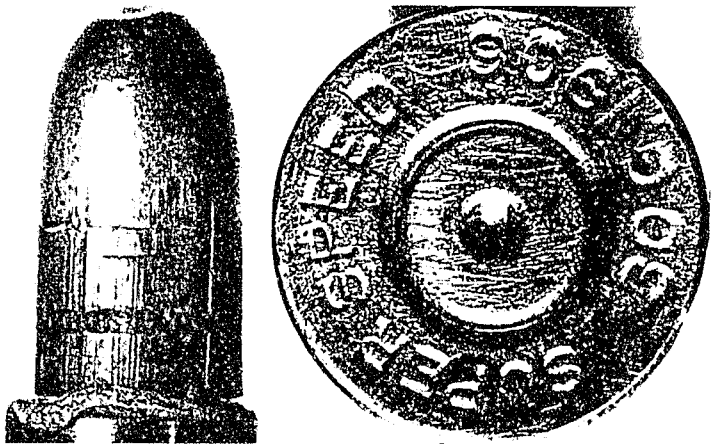


Figure 14
Microscopic Striae on a Bullet and Casing

Gunshot Residue

When a firearm is discharged, the bullet along with gases, burned, unburned and partially burned gunpowder are also expelled from the muzzle. These materials exit the muzzle in a cone shaped pattern and based upon the spread of these particles, the distance from the muzzle to the target can oftentimes be determined. See Figure 15.

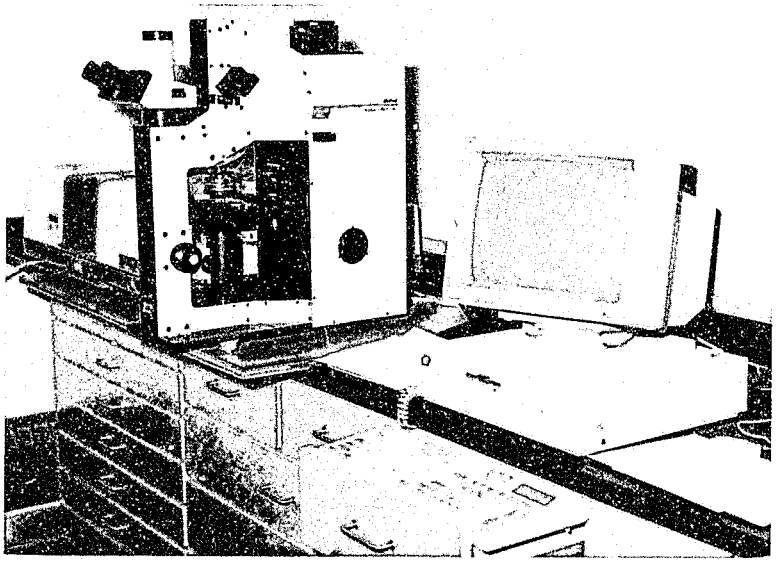
Figure 15

Infrared Photograph of Gunshot Residue

NOTE: **Chemical tests designed to detect the presence of gunshot residues is no longer utilized as a method for determining if an individual has fired a firearm.** (See Appendix A)

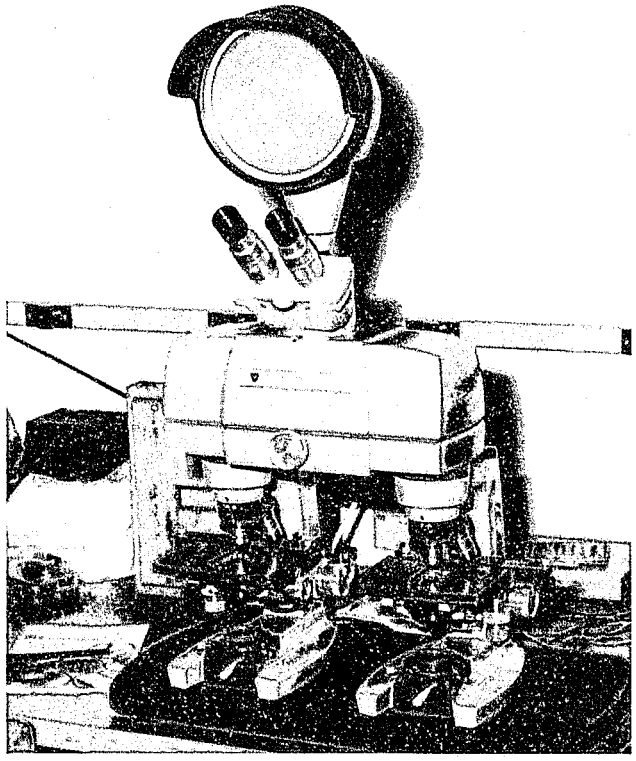
INSTRUMENTATION

Fourier-Transform Infrared Spectrophotometer



An instrument which directs radiation from a broad band *infrared* source through materials. The resulting infrared spectrum is used to identify and compare the molecular structure of paints, fibers and other types of trace evidence.

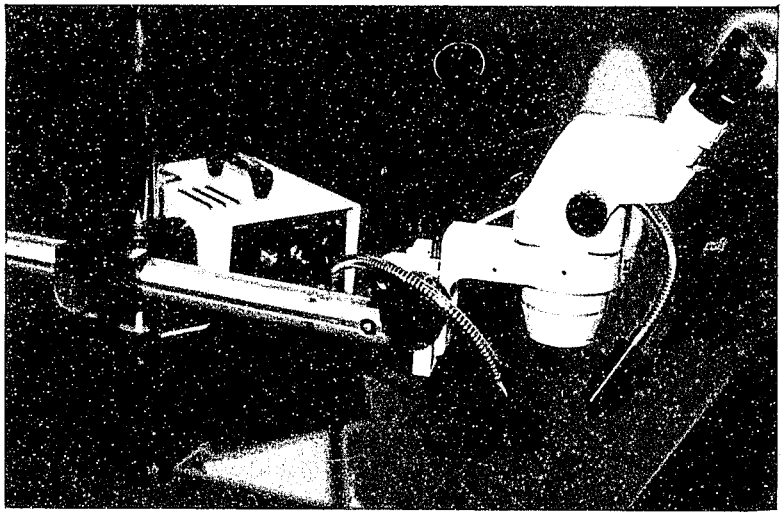
Comparison Microscope (Transmitted Light)



Two biological microscopes which have a common eye piece used for the identification and comparison of hairs and fibers.

Stereo-

Microscope

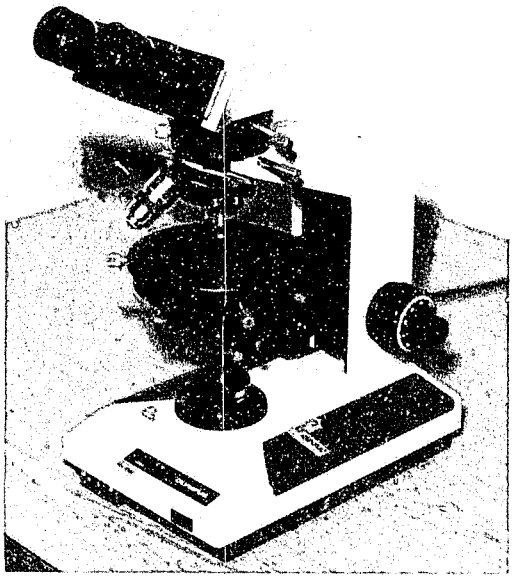


A microscope of low to moderate magnification used to search for microscopic evidence such as paint chips, fibers and glass. The stereo-microscope is also employed in sample preparation.

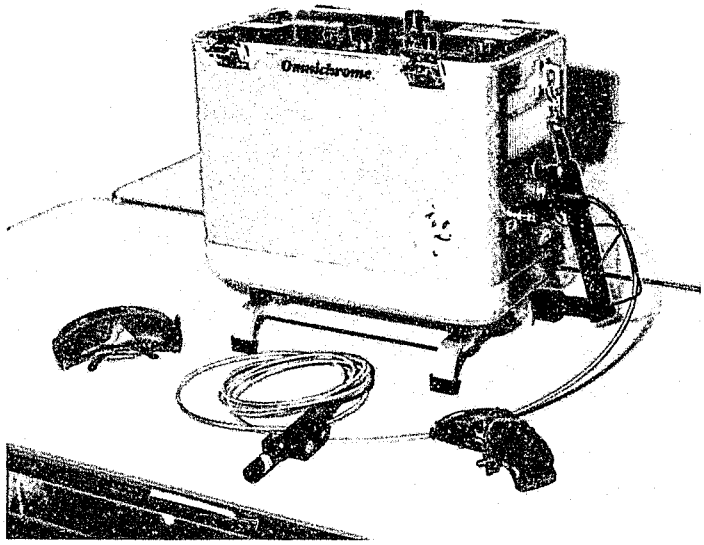
Polarized

Light

Microscope

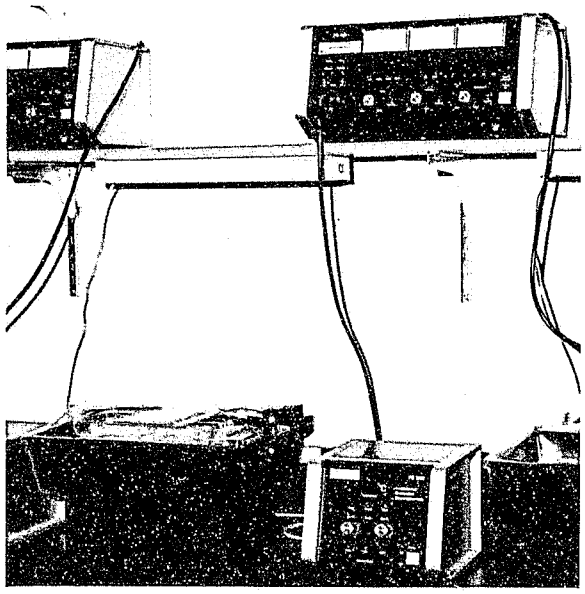


A biological microscope containing several accessories, which allow the analyst to measure various optical properties, employed in the identification of fibers and various inorganic substances.



Argon Laser

A single band, high intensity light source used for the detection of body fluids, fibers and fingerprints.



Electrophoresis Equipment

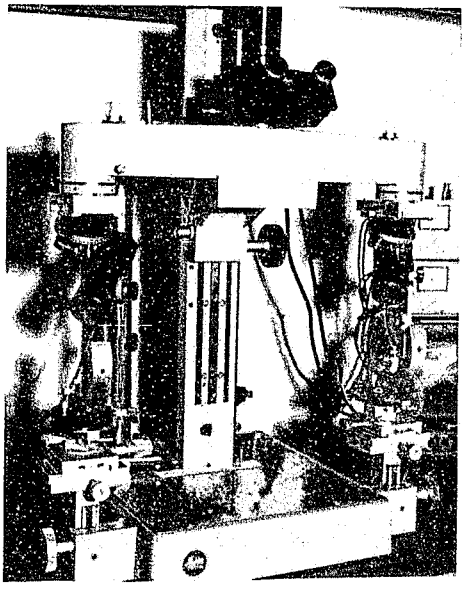
Specialized instruments which are used for further classification of blood and body fluids beyond the ABO blood type.

Microspectrophotometer

This instrument directs radiation from a broad band *light source* through materials. The resulting absorption spectra are used to compare the dye components of paint, fibers and other types of colored evidence.

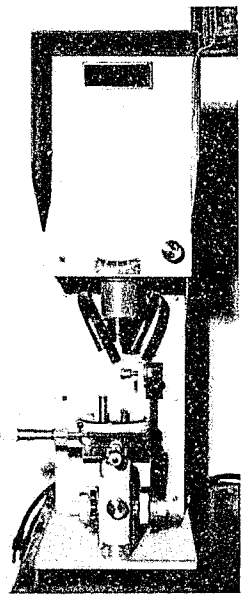
Comparison Microscope

(Reflected Light)

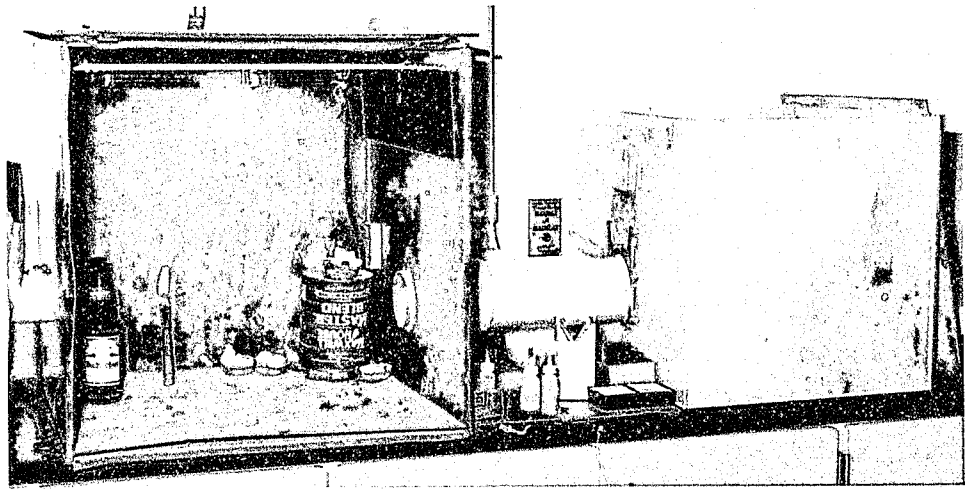


Similar to the transmitted light comparison microscope, however, light is reflected off the material being analyzed. Utilized in the identification and comparison of bullets, casings and tool marks.

Microscopic Measuring Projector

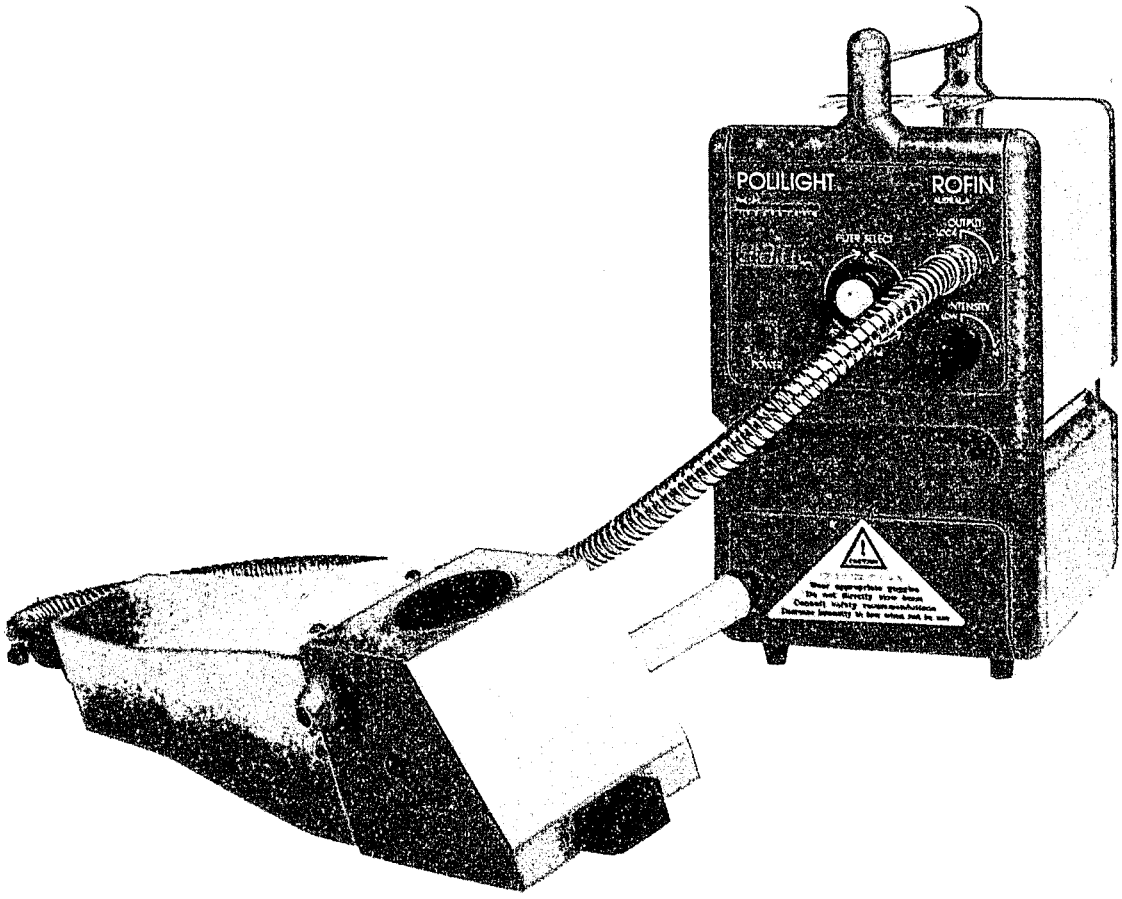


A microscopic projector used to measure the widths of lands and grooves and pitch of the rifling on a bullet. These measurements are used to determine the possible manufacturer of the firearm from which a bullet was fired.



Fingerprint Fuming Tank

A sealed tank utilized for the fuming of non-porous fingerprint evidence with cyanoacrylate (super glue) fumes. This allows for the development of a durable, visible residue on the fingerprint impression.



Poli-Light

A multi-band, alternate light source used in crime scene processing for the visualization of fingerprints, biological stains, fibers, and questioned document examinations.

How evidence on or from dead bodies is handled depends upon the nature of the case. The greatest care should be given to evidence when there is suspicion of criminal activity involved in the death. Occasionally it is not until the autopsy is performed that the criminal nature of a death becomes clear. Therefore, it is better to be safe.

Even when there is nothing suspicious, evidence may be needed to determine the cause (electrical burns on clothing to support electrocution) or circumstances (spatter on a weapon in suicide) of death. **REMEMBER, "ONCE THE BODY HAS BEEN RELEASED, ALL THE EVIDENCE IS GONE!"**

CASES OF SUSPICIOUS DEATH

In cases of suspicious death, the medical examiner will usually respond to the scene. The body will be transported to the morgue where an autopsy will be performed. Only evidence which may be lost in transport should be taken prior to removal of the body. This evidence should be handled exclusively by persons experienced in evidence collection.

NOTE: Suspicious deaths include hit and run motor vehicle pedestrian deaths.

Cases in which the medical examiner responds to the scene

After the medical examiner has seen the body, trace evidence may be removed *unless* there is going to be an autopsy. If an autopsy is to be performed, only evidence which may be lost during transport should be removed.

Cases in which the medical examiner does not respond to the scene

The evidence on the body, unless it will be destroyed or lost in transport, should be left on the body until the medical examiner views the body at the morgue. It is acceptable, if the medical examiner is not going to the scene or when there is no question about there being a problem, to remove the wallet for identification.

NOTE: *ALL CASES GOING TO AUTOPSY SHOULD BE HANDLED AS A SUSPICIOUS DEATH - THAT IS THE EVIDENCE SHOULD BE LEFT ON THE BODY.*

MOVEMENT OF BODIES

Bodies should not be moved prior to authorization from the medical examiner or the Office of Chief Medical Examiner unless there is danger of further destruction or loss such as in fires or bodies of water. Bodies in public places may be moved to clear the right of way. The Office of Chief Medical Examiner should be called before this is done.

Bodies in suspicious cases and cases going to autopsy should be bagged in a new light body bag. The body can then be bagged in a heavier reusable bag for transport. In suspicious cases, the hands should be covered by **paper bags** (not plastic) and secured in place before bagging the body.

The transporting funeral director should be advised that no sprays or embalming fluid should be placed on bodies which will be autopsied or tested for toxins.

Photography, diagrams, chalking

Before bodies are moved they should be photographed in position and diagrammed with respect to fixed objects. If the body must be moved before

all search and examination is completed, the scene may be chalked to show the position and location of the body.

If the body is not going to autopsy and the death is traumatic (suicide or accident) photographs should be taken of all injuries. **Close up pictures** of suicidal gunshot wounds and blood spattering, especially on the hands, should be taken. Wounds should be photographed before and after they have been washed free of blood.

PERSONAL PROPERTY

Identification

The wallet may be removed to determine identification. Because the exact position of the body may be important to the investigation, this should **not be done** in suspicious cases, until after the body has been photographed and viewed by the medical examiner and crime scene processing technician. If the wallet has been removed it should either be sent with the body or the body tagged with: **the exact spelling of the victim's name, date of birth, address, source of the identification information and name and department of the person tagging the body.** This information is important for Medical examiners, pathologists and funeral homes.

Clothing

Whenever there is a suspicious case or the body has not been examined by a medical examiner, the clothing should be left in place. The investigator(s) should not disturb the clothing in a case going to autopsy without first checking with the Office of Chief Medical Examiner regardless of whether the death is suspicious or not. Clothing should not be cut or torn, however, rescue personnel may have to do so if they believe the person may still be alive and in need of care. In such situations, the personnel **must not cut** through any holes or tears in garments. If the clothing has been removed at a hospital, or by a medical examiner before the need for autopsy has been determined, it should be secured by the officer and sent with the body. If the body has already been transported, the clothing should be brought to the autopsy. In many cases of a non-suspicious nature, this may not be necessary. Therefore if you have questions, **call** the Office of Chief Medical Examiner before bringing clothing to the autopsy in Augusta.

NOTE: In many forensic cases the clothing is as important as the body for reconstructing the situation.

Medications

Medications, drugs of abuse and drug paraphernalia should be sent with the body or brought to the Office of Chief Medical Examiner before the autopsy.

Water soaked papers

Papers which are stuck together and are wet should be sent to the Office of Chief Medical Examiner for freeze drying as attempts to separate them may destroy their integrity.

Suicide notes, tapes and other message forms

According to law these should be sent or taken to the Office of Chief Medical Examiner. Originals should never be given to anyone except the Office of Chief Medical Examiner. If the department wishes to retain an original note and send a copy to the Office of Chief Medical Examiner the office should be called and asked if such a practice is acceptable in the particular case.

TRACE EVIDENCE

If the body is not going for autopsy, trace evidence should be removed after the medical examiner sees the body and before it is released to the funeral home for embalming or restoration.

Loose objects

In general, items on the body should be left on the body for the medical examiner and autopsy pathologist to see. Occasionally there are items which might be lost or destroyed during movement of the body. Such items can be removed. Large knives have successfully been left on bodies transported hundreds of miles for autopsy with no harm done. Rarely is it necessary to take evidence from a body at the scene when it is going to autopsy.

NOTE: Remember to securely bag hands in paper bags prior to movement.

Hair samples

Hair samples should not be taken from any body going for autopsy, prior to autopsy.

Sexual assault evidence

Samples to document sexual contact should not be taken from any body going for autopsy, prior to autopsy.

Food

While not on the body, it is advisable to check for evidence or witnesses who know the last meal of the victim in order to help establish the date and time of death.

Insects

While insects on the body will be collected by the pathologist on all bodies going to autopsy, it should be remembered that insects which have wandered from the body and their pupa cases (which resemble rodent feces) may be found at the scene under leaves, rocks, etc. and must be collected. Since live insects may be needed to establish the time of death **NO INSECTICIDE SHOULD BE USED ON OR NEAR THE BODY AND THE FUNERAL DIRECTOR REMOVING THE BODY SHOULD BE TOLD NOT TO USE ANY CHEMICAL ON IT.** Samples can be taken from bodies not going to autopsy to help establish the date of death. These should be placed in approximately

70% alcohol (such as rubbing isopropyl alcohol) and sent to the Office of Chief Medical Examiner.

FINGERPRINTING

Latent fingerprints

It is rarely possible to get latent fingerprints from a body which has no blood on it unless the contact took place just prior to the discovery of the victim. If there is blood on the body, a special spray may allow development of latent prints. This is usually done in a special room as the spray is carcinogenic and flammable. **Special care should be taken when moving and bagging a body with potential blood prints. The best prints may come from an area not visibly contaminated with blood.** Before attempts are made to spray the body for latent fingerprints, the Chief or Deputy Chief Medical Examiner should be consulted.

Body prints

Bodies going to autopsy should not have the fingers printed prior to the autopsy. If it seems wise to check a single finger against a card for identification, call the Chief or Deputy Chief Medical Examiner before doing so.

If there is not going to be an autopsy, prints can be taken after the medical examiner sees the body.

WEAPONS

Whenever possible, it is best to bring weapons to the autopsy. If that is not feasible, then the weapon type should be reported to the Office of Chief Medical Examiner. For cases involving a stabbing, record and report the measurements of the stabbing instruments. In cases where there is no scene visit, the weapon should be described to the medical examiner for their report. If the medical examiner responds to a scene which will not require autopsy, he/she should view the weapon.

REMOVAL OF BULLETS

Bullets should not be removed prior to autopsy. If the body is not going to autopsy and the bullet is readily accessible, such as just beneath the skin, the medical examiner may remove it for you. Bodies should not be sent for autopsy merely for the removal of a bullet in clear cases of suicide.

TOXICOLOGY, DNA AND SEROLOGY SAMPLES

Sampling in autopsy cases

In cases going to autopsy, samples should not be taken from the body prior to autopsy. Under rare circumstances, the medical examiner may take a vitreous sample to determine time of death. This should only be done by or under the direction of the Chief or Deputy Chief Medical Examiner. The medical examiner must **record the time the sample was taken**.

Sampling in cases not going to autopsy

The medical examiner is the person who should take forensic samples. Such samples should not be collected by a nurse, technician, other doctor or funeral home operator. Blood alcohol will not change after death until decomposition advances. There is no need to get specimens for alcohol within two hours in deceased persons. The samples should be taken with clean utensils. **Do not use** funeral home equipment or collect after embalming has started as contamination is common under such circumstances. A blood alcohol kit should be sent with the tagged body for sampling.

Blood or vitreous samples should be placed in a gray stopper (fluoride) tube and promptly taken to the laboratory.

NOTE: The Crime Laboratory does not perform blood alcohol or toxicology testing.

Serology samples

The same rules apply to serology and DNA samples as apply to toxicology samples. In cases where transfusions may have been given to patients transported to the hospital, the hospital may be the best source for uncontaminated specimens for DNA and serology testing. See the section on this matter in the general portion of this manual. Both red stopper (no preservatives) and purple stopper (EDTA) tubes should be taken.

TESTING

All samples should be sent to the Office of the Chief Medical Examiner. Samples to be analyzed for alcohol testing only may be sent to a local laboratory. Hospital laboratories should not be used for testing samples from dead bodies. All toxicology samples, except those for alcohol, should be sent exclusively to the Office of Chief Medical Examiner.

HIV testing

Samples for HIV testing may be taken by the Medical Examiner or, in cases going to autopsy, by the pathologist. The Office of Chief Medical Examiner should be called if the HIV testing is required for personnel safety reasons. The interested party will be referred to the Department of Human Services to arrange for the testing. The sample will be forwarded to the Department of Human Services by the Office of Chief Medical Examiner. This procedure is used only for dead bodies. For the living, arrangements should be made through the victim's medical care giver.

SPECIAL CASES

Infants

These deaths are investigated by the departments designated to do so by the Attorney General. In these cases a culture sample may be taken by the emergency room or attending physician. There is special protocol for the gathering of evidence in these cases that all involved investigators from the designated departments should be familiar with so they may act accordingly. (See Appendix B)

Hit & run - pedestrian motor vehicle

The procurement of evidence should follow the same rules as for homicides.

Questionable driver status motor vehicle deaths

If there is a question as to which occupant was driving, the Office of Chief Medical Examiner should be advised of the situation. An autopsy will usually be done. The rules concerning evidence from the deceased apply the same as for homicides. Inform the Office of Chief Medical Examiner so the clothing can be preserved and samples of hair and blood can be taken. The living victim may also be the source of trace evidence which might be matched with evidence found in the vehicle or at the scene. The rules for procuring this evidence are covered in the rest of this manual. Sampling from the vehicle should be done before it is released from impoundment.

Diving deaths

Arrangements should be made to have the diving equipment inspected by an expert who will agree to submit a report as to the condition of same. OSHA may be consulted for on job diving deaths with regard to equipment inspection.

Environmental toxin or asphyxia deaths

When bodies are recovered under circumstances suggesting a poisoning or a lack of oxygen, samples should be taken of the atmosphere or the poison source. **CARE MUST BE TAKEN TO AVOID EXPOSURE OF ALL THE RESPONDING OFFICIALS.** Samples, if not analyzed at the scene by gas sampling devices, should be sent to the Office of Chief Medical Examiner. OSHA may take this responsibility for on-the-job deaths. When a heating unit or internal combustion engine is suspected, a blood sample should be taken by the Medical Examiner or pathologist and the equipment should be inspected before the scene is released to occupants.

Food poisoning

Samples of the food should be taken and sent to the Office of Chief Medical Examiner.

Hazardous equipment related deaths

Equipment which is suspected to be the cause of death might have to be impounded. OSHA will usually inspect equipment involving on-the-job deaths. For consumer products, Consumer Product Safety may inspect the item. The

Office of Chief Medical Examiner will notify CPS and they will make arrangements or advise if the equipment can be released. The Office of Chief Medical Examiner should be advised of the brand, model and type of equipment for their contact with CPS.

Fire and carbon monoxide deaths

Detection of carboxyhemoglobin must be conducted using blood samples. **Vitreous fluid is not suitable**. The medical examiner should be requested to take the sample. If an autopsy has not been ordered, the air passages must be opened by a medical examiner, to look for soot in all fire deaths.

Bones and possible human tissue

If there is no scene, such as when the specimen is turned over to the police by the person finding it, the specimen should be taken or sent to the Office of Chief Medical Examiner for identification. If there is a potential for a homicide scene, the specimens should be forwarded immediately to the Office of the Chief Medical Examiner, as local parties are not generally reliable.

THE BASIC RULE IS, EVIDENCE ON OR IN THE BODY SHOULD BE LEFT THERE UNTIL TAKEN BY THE PATHOLOGIST AT AUTOPSY OR IN THE PRESENCE OF THE MEDICAL EXAMINER IF THERE IS NO AUTOPSY.

Certain exceptions have been noted above.

SEARCH FOR BODIES OF MISSING PERSONS

Cases in which the body has not been found

When a person is missing or the police are asked to locate a person felt to be in danger of death, the Office of Chief Medical Examiner should be advised. After a while, if the person has not been found, statute requires the OCME to develop a file to be used for identification. This file includes medical and dental records, X-rays and details of clothing and personal property. The appropriate law enforcement agency will be given a form and instructions on how to collect this material. Collection of the material should be done as soon as appropriate.

If an area has been identified where the body is suspected to be, the Office of Chief Medical Examiner can be notified to obtain the services of dogs and a handler used by the medical examiner's office to assist in the search.

GLOSSARY

Absorption-Elution — Analytical test method used to detect the presence of antigens in a bloodstain.

Absorption-Inhibition — Analytical test method used to detect the presence of antigens in body fluids.

Accidental Characteristics — Imperfections or irregularities produced by chance during manufacture or caused by use, abuse, corrosion, rust or damage to an object. See Individualizing Characteristics. (p. 6)

Acid Phosphatase — An enzyme found in high concentrations in semen. The detection of acid phosphatase is used as a presumptive test to indicate the presence of semen.

Blood — A fluid composed of many different kinds of cells and dissolved substances. Blood consists of a cellular fraction containing red and white blood cells and platelets and a liquid fraction called plasma. Antigens are present on the red blood cells and antibodies are present in the plasma. (p.53)

Choline — A by-product of dried semen. The detection of choline is used as a presumptive test to indicate the presence of semen. (p. 54)

Class Characteristics — Characteristics that all the members of a certain class of objects or substances have in common. (p. 6)

Cyanoacrylate — Also known as "Super-glue". It is a man-made plastic monomer molecule that can form long chain polymers by combining with similar/identical molecules. Cyanoacrylate is very unstable as a monomer and can be triggered into polymerization by small amounts of moisture such as the residues left by a fingerprint.

Deoxyribonucleic acid (DNA)

A molecule which acts as a genetic blueprint. DNA consists of two strands of matching nucleotides (adenine, guanine, cytosine and thymine) that are arranged in a double helix. (p. 53)

Direction of Twist

Class characteristics imparted in the barrel of a rifled firearm during manufacturing. Spiral rotation is either in the left or right direction. (p. 58)

Fingerprint

An impression of the friction ridge skin on the inner surface of a finger or thumb. (p. 57)

Fingerprint Residue

The residue left on an item from its being touched by the fingers or hands. This residue usually consists of sweat and sebaceous secretions from the body or from a contaminant on the hands such as grease or blood.

Florence Iodine Crystals

Characteristic crystal formations which indicate the presence of choline in a stain. (p. 54)

Fluorescent Agents

Chemicals or powders which may be applied to an object to enhance the luminescence of latent fingerprint impressions under laser or other alternate light source.

Forensic Science

The application of science and scientific methods to analyze, identify and compare materials for presentation in courts of law also known as "Criminalistics". (p. 4)

Friction Ridges

Minute ridges of skin on the hands and feet caused by elevations in the dermis layer of the skin called papillae. The friction ridges function in aiding the sense of touch and grasping ability by increasing the surface area of the hands and feet. (p. 57)

Gentian Violet

A chemical used to develop latent fingerprint impressions on tape or other sticky/tacky surfaces.

Grooves	The depressed portion between the lands in a rifled bore. (p. 58)
Hair	A slender threadlike outgrowth from the follicles of the skin of mammals, composed essentially of keratin and having three anatomical regions of forensic importance: The cuticle, cortex and medulla. (p. 55)
Individualizing Characteristics	Refers to the demonstration that a particular sample is unique, even among members of the same class. (p. 6)
Inked Fingerprint Impression	An impression of a finger recorded in ink on a fingerprint card. Also called "known origin" fingerprints. (p. 57)
Land and Groove Impressions	The negative impressions on the bearing surface of a bullet caused by the rifling in the barrel from which it was fired. (p. 58)
Lands	The raised portion between the grooves in a rifled bore. (p. 58)
Latent Fingerprint Impression	An invisible or nearly invisible fingerprint usually left by chance on an object that must be processed in some manner to render it visible. Also called "unknown origin" or "crime scene" fingerprints. (pgs. 20 & 57)
Lattes Crust	Analytical test method used to detect the presence of antibodies in a bloodstain.
Lewis Type	Genetic characteristic which is used to determine an individual's secretor status.
Ninhydrin	A chemical used to develop latent fingerprint impressions on objects by reacting with the amino acids present in the sweat and sebaceous residue of the fingerprint.
Oblique Lighting	Using a strong light at cross angles to highlight impressions on the surface of an object. (p. 34)

P30	A prostate specific antigen which is used to identify the presence of semen in a stain. (p. 54)
Palmprint	An impression of the friction ridges found on the inner surface of the hands.
Pattern Area	The pattern area is the only part of finger impressions which is used for the interpretation and classification. The pattern area is located on the end finger joints and contain the cores, deltas and friction ridges which are concerned in classification. (p. 57)
Poli-light	Also called "alternate light source". A Poli-light is a commercial brand name for a powerful light created by a xenon arc lamp bulb used in conjunction with special filters. The purpose of an alternate light source is to illuminate objects under various wavelengths of light in the ultra-violet and visible ranges to detect trace evidence. (p. 65)
Powder Dusting	A technique used to develop latent fingerprint impressions by the application of fingerprint powder to an object with a fingerprint brush or wand.
Presumptive Tests	Tests which indicate but do not confirm the presence of blood or body fluids in a stain. (pgs. 53 & 54)
Rate of Twist	The distance it takes for a bullet to complete one revolution inside a rifled barrel. (p. 58)
Rifling	Helical grooves in the bore of a firearm barrel to impart rotary motion to a projectile. (p. 58)

Secretor — An individual whose body fluids (ie; semen, sweat, saliva) contain certain antigens which directly reflect that individual's ABO blood type. (p. 15)

Semen — The male reproductive fluid. Semen is composed of two fractions: a cellular fraction consisting of sperm cells and a liquid fraction composed of various proteins enzymes and secretions. Antigens may be present in the liquid fraction. (p. 54)

Silver Nitrate — A chemical used to develop latent fingerprint impressions on an object by reacting with the salt present in fingerprint residue.

Small Particle Reagent — A chemical used to develop latent fingerprint impressions on an object which is wet or has been wet.

Sperm Cell — The male reproductive cell. (p. 54)

Takayama Crystal — Characteristic crystal formation which confirms that a sample is blood.

U.S. Department of Justice

Federal Bureau of Investigation

Washington, D. C. 20535

February 1, 1994

Dear Crime Lab Director:

Effective February 1, 1994, the FBI Laboratory will no longer perform tests on physical evidence for the presence of gunshot primer resides (GSR). This applies to the particle method using scanning electron microscopy and the bulk method using atomic absorption spectrophotometry and inductively coupled plasma spectroscopy. As of the effective date for this policy, items submitted for GSR analysis will be returned to the contributor without examination and in the same condition received in the FBI Laboratory. Law enforcement agencies submitting GSR evidence will be encouraged to utilize state or local crime laboratories in their areas or commercial testing facilities.

The FBI will continue to provide specialized training courses for the analysis of GSR evidence to technical personnel from state or local crime laboratories. These courses will be offered through the Forensic Science Research and Training Center at Quantico, Virginia.

Sincerely yours,

John W. Hicks
Assistant Director in Charge
Laboratory Division

SCENE INVESTIGATION IN DEATHS OF INFANTS AND CHILDREN

The tendency of Rescue personnel is to transport the infant or young child to the hospital, even when there are obviously no signs of life, thereby leaving no immediate scene for viewing by the Medical Examiner and police investigators. Because the autopsy in young children and particularly infants (< 1 year of age) often has a lack of findings, determination of cause and manner of death (asphyxias in particular) is frequently dependent upon a thorough investigation of the scene. Consequently, the realization that a case may be a homicide or an unrecognized accident may be delayed or never even considered. Not infrequently, fatal child abuse is first discovered at autopsy or even much later, with toxicology, and the scene has long since been compromised.

In all infant deaths, the detective will call the Department of Human Services to determine if there is any previous history of abuse in the family. This information could be helpful to the Medical Examiner's Office and us. It should be done as soon as possible.

The Department of Human Services Hotline telephone number is:

1-800-452-1999.

You can fax this form directly to the Chief Medical Examiner at:

624-7178

The Hotline number for the Chief Medical Examiner is:

1-800-870-8774.

If parents wish to discuss the results of the autopsy with the pathologist, they should provide a telephone number where they can be reached in the next 1-2 days or call 624-7180 (Office of the Chief Medical Examiner).

The Maine SIDS Program, Div. of Public Health Nursing, DHS is notified of all infant deaths and some indication of probable or possible cause is given to the person in charge. The local public health nurses attempt to contact the parents by letter/telephone and/or in person in a reasonably expeditious manner.

MAINE STATE POLICE
CRIMINAL INVESTIGATION DIVISION

INFANT DEATHS

Incident Date:_____

Case #:_____

Investigator's Name: _____

VICTIM's NAME: _____ **DATE OF BIRTH:**_____

LOCATION:

1. Location where infant found: Be specific (Infant's residence, grandmother's house, etc.).
   _____
2. Description of location: Unheated apartment, mobile home, etc.
   _____
3. Precise room infant found:_____
4. Precise description of where infant found: Crib, bassinet, car bed, play pen, adult bed, couch, etc.
   _____
5. Try to reconstruct position of bedclothes, toys and other items in bed w/infant when found. (Use stuffed animal or doll) **Photos are a must.**
6. Description of bedding:
   - ? Mattress_____ ? Firm_____
   - Mattress covering (Sheet, pad, feather bed, etc).____
   - ? Pillow (? Firm or fluffy)_____
   - Blankets (down comforter, receiving blanket, fluffy quilt, etc.) _____
   - ? Sheepskin _____?beanbag pillow or mattress_____
   - Any exposed plastic? _____
7. If in adult bed:
   - Soft or hard mattress?_____? Waterbed_____? Heated_____Any exposed plastic? _____
   - Adults and/or children in bed w/infant + ages and weights_____
   - Exact position of infant and larger person when found_____
   - Any drug or alcohol use by adults?_____
8. List other items in bed with infant._____
9. Retrieve any unusual bed or bedding for examination by Medical Examiner.
10. Type of heat? _____ Outdoor temperature: _____ Room temperature: _____
11. Ventilation of room: _____
12. General housekeeping, etc. _____

PEOPLE:

1. List everyone who lives there or was present at the time of occurrence with ages and precise relationships.
   _____
   _____
2. Is adult male the father of infant?_____
3. Are parents married?_____
4. Do siblings have same parents? _____
5. Family members known to police for any reason? _____
6. Drug or alcohol abuse by family members? _____
7. Any other children known to DHS or in someone else's custody? _____
8. In anyone else's care in last 48 hours? ☐ yes ☐ no If yes, who? _____
9. Does anyone in the immediate household or daycare provider smoke? ☐ yes ☐ no If yes:
   Relationship:_____ # packs per day _____
10. Did the infant's mother smoke during pregnancy? ☐ yes ☐ no
11. Did anyone smoke regularly around the mother during pregnancy? ☐ yes ☐ no

EVENT:

1. Last fed? _____
2. Put "to bed" when? _____
3. Last seen alive? _____ When? _____ By whom? _____
4. Found unresponsive at what time? _____ By whom? _____
5. Placed or last seen alive on stomach? Side? or Back? _____
6. Found on stomach? Side? or Back? _____
7. Position of face when found? Face up or down? To right or left? _____
8. Any unusual position or wedging of chest, head or neck? _____
9. Infant hot or sweaty when found? _____
10. What clothes was infant wearing? List assorted layers. _____
11. Try to reconstruct exact position of infant when found. (Use stuffed animal or doll) **Photos are a must!**
12. Attempted resuscitation? How and by whom? _____

FOOD:

1. Breast or bottle fed? _____
2. Any general problems with feeding? _____
3. If bottle fed:

   What kind of formula? Other fluids? (Water, juice, pedialyte) _____
   Who mixed last batch of formula? _____
   If outside of home, who provided last bottle? _____

4. How much did infant drink or eat at last feeding? _____
5. Eating any other foods? Honey in last month? _____
6. If available, retrieve last bottle, last batch of formula, or last opened can/box of formula.
7. Adequate food present in house? _____

NOTE: If the infant was in someone else's care, you need to ask all of the above questions and ascertain if any other children have died in that person's care.

MEDICAL HISTORY:

1. Any problems with this pregnancy or delivery? _____ Birth Weight? _____
2. Born at which hospital? _____
3. Ever admitted to hospital after birth? _____ What for? _____
4. Regular pediatrician? _____ Name? _____ Last seen? _____
5. Routine visits? _____ Immunizations? _____ For illness? _____
6. Any ER visits? _____ When, **where** and what for? _____
7. Taking any medications? (including Tylenol, cough syrup, etc.) or home remedies? _____ **If available retrieve.**
8. Any recent symptoms? Sniffles, diarrhea, etc.? _____
9. Any injury? _____
10. Any other family members or pets ill? _____
11. Exposed to recent illness elsewhere or large gatherings? (day-care, family gathering, travel, baptism, etc.) _____
12. Any history of SIDS in family? _____
13. Any history of sudden death or unusual disease in family? _____
14. Regular child care provider? (Infant's res., home of provider, other) _____

State of Maine
DEPARTMENT OF THE ATTORNEY GENERAL
State House Station 6 • Augusta, Maine 04333

Protocol

for the

Investigation of

Violent, Unnatural, Unattended,

Unexplained, Suspicious, or Suspected

Deaths

Michael E. Carpenter
Attorney General

June 1, 1993

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59 PREBLE STREET
PORTLAND, MAINE 04101-3014
TEL: (207) 822-0260

June 1, 1993

Dear Colleague:

Please find enclosed an updated version of the protocol of this office as it applies to the investigation of violent. unnatural, unattended, unexplained, suspicious or suspected deaths. The protocol is to be followed by all law enforcement officers. It is especially designed for the first law enforcement officers arriving at the scene of a death.

Procedures for special circumstances involving fire deaths, deaths while in custody or confinement, disasters with multiple deaths, hunting fatalities, police-involved deaths, workplace fatalities, and child deaths are also included in the protocol. In addition, one page of the protocol contains a quick reference to telephone numbers. Finally, the policy of this office as it relates to police-involved deaths is enclosed for your information.

Thank you for your continued cooperation in helping to provide the high level of law enforcement services to which the citizens of Maine have become accustomed. Questions about this protocol may be addressed by contacting Deputy Attorney General Fernand LaRochelle, Chief of the Criminal Division (626-8500), or Director of Investigations Brian MacMaster, Chief of the Investigation Division (626-8520).

Sincerely.

MICHAEL E. CARPENTER
Attorney General

Enclosures

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MEMORANDUM

DATE: June 1, 1993

TO: All Law Enforcement Agencies

FROM: Michael E. Carpenter, Attorney General MEC

RE: Investigation of Violent, Unnatural, Unattended, Unexplained, Suspicious, or Suspected Deaths

I. BACKGROUND

The Attorney General is charged with the investigation and prosecution of all homicides occurring in the State of Maine. 5 M.R.S.A. § 200-A. The purpose of this protocol is to establish procedures for law enforcement agencies in cases of violent, unnatural, unattended, unexplained, suspicious, or suspected deaths.

Technical assistance and expertise are indispensable to the successful investigation and prosecution of homicides. This office will continue to rely upon the State Police Criminal Investigation Division (CID) as its primary homicide investigative arm with such exceptions as will be noted here or in other written instructions from this office.

While it is implicit in these procedures that a death has occurred, it is important to note that the procedures are also applicable to those situations where there is no body, but there is evidence that a death may have occurred, as in the case of a missing person where there are signs that violence may have occurred.

II. IMPORTANCE OF DEATH SCENE CONTROL

Control of the death scene is a primary focus of these procedures. Often, the medical examiner can gain valuable insight into the cause and manner of death, as well as the time of death, from viewing the scene and the body at the scene. Moreover, the scene is sometimes replete with subtle clues which could aid in the identification or discovery of the perpetrator. All, or a significant part, of this evidence could be lost through inadvertent disturbance of the scene by persons lacking the required expertise.

III. PROCEDURES TO BE FOLLOWED IN ALL CASES INVOLVING VIOLENT, UNNATURAL, UNATTENDED, UNEXPLAINED, SUSPICIOUS, OR SUSPECTED DEATHS

A. The first law enforcement officer arriving at the scene of a death is charged with the following duties:

1. Without disturbing the body, determine that death has in fact occurred. If there is any evidence of life, all necessary life-sustaining measures should be initiated.

2. Without disturbing the scene, make a cursory examination of the scene to determine if the death is at all suspicious. (All deaths resulting from gunshot wounds where the victim did not fire the fatal shot are to be considered "suspicious" until a thorough investigation has determined otherwise.) If the death is at all suspicious (or there is no body, but there is evidence that death may have occurred), the following procedures will be followed:

(a) Secure and protect the scene until the arrival of a representative of the Attorney General. The body should not be moved unless the body is in immediate danger of destruction or further damage.

(b) Notify superiors and the Chief Medical Examiner's Office, the State Police Criminal Investigation Division (except in Bangor and Portland), and the District Attorney. The Chief Medical Examiner will be contacted by calling 1-800-870-8744, and arrangements will be made to have a medical examiner come to the scene. The Chief Medical Examiner will notify the Attorney General's Office. If you wish, however, you may obtain the name and telephone number of the

Attorney General duty officer from the Office of the Chief Medical Examiner or State Police Dispatch (1-800-452-4664) enabling you to be in direct contact with the duty officer.

(c) Record names, addresses, telephone numbers, and other pertinent information of all persons present (they may be important witnesses) or assign another person to this task.

(d) Maintain a timetable of all persons arriving and leaving the scene.

(e) Arrest the perpetrator or detain the suspect when probable cause exists and circumstances require it.

(f) Do not undertake a formal interview with the person in custody without first discussing this procedure with the Attorney General representative or State Police detective in charge.

B. If the death is of a non-suspicious nature, the following procedures will be followed:

1. Notify superiors.

2. Notify the Chief Medical Examiner by calling 1-800-870-8744.

3. Conduct a thorough investigation following departmental procedures.

C. All violent non-suspicious deaths, e.g., motor vehicle deaths, will be reported immediately to the District Attorney and the Chief Medical Examiner.

IV. ADDITIONAL PROCEDURES FOR SPECIAL CIRCUMSTANCES

A. ***Fire Deaths.*** The State Fire Marshal's Office is designated as the official representative of the Attorney General in the preliminary investigation of fatal fires. The police or fire department officer discovering a body in a fire is charged with notifying the State Fire Marshal's Office by calling 1-800-452-4664 (State Police Dispatch), and the Chief Medical Examiner by calling 1-800-870-8744. The scene shall not be disturbed or the body moved until authorized by a representative of the Fire Marshal's Office and the medical examiner unless the body is in immediate danger of destruction or further damage. If

arson is suspected or the death is otherwise suspicious, the case should be handled as any other suspicious death. (See Section III above.)

B. ***Deaths while in custody or confinement.*** Unless obviously due to a natural cause, the death of an individual while in custody or confinement shall be reported immediately to the Chief Medical Examiner and the Attorney General's Office as outlined in the preceding sections. (See Section III above.)

C. ***Disasters with multiple deaths.*** Regardless of whether clearly accidental, the Chief Medical Examiner and the Attorney General's Office shall be notified of disasters with multiple deaths as outlined in the preceding sections. (See Section III above.)

D. ***Hunting fatalities.*** The State Warden Service is designated as the official representative of the Attorney General in the preliminary investigation of hunting fatalities. The police officer encountering an apparent hunting fatality is to notify the Chief Medical Examiner by calling 1-800-870-8744, and the State Warden Service by calling 1-800-452-4664 (State Police Dispatch) in Augusta. The scene shall not be disturbed or the body moved until authorized by a representative of the State Warden Service and the medical examiner unless the body is in immediate danger of destruction or further damage.

E. ***Police-involved deaths.*** The Investigation Division of the Attorney General's Office is designated as the official representative of the Attorney General in the investigation of police-involved deaths. A "police-involved death" means a death resulting from a law enforcement officer's action. Not included, however, is any motor vehicle fatality unless it results from the imposition of non-deadly or deadly force by a law enforcement officer, to include high speed chases and police roadblocks.

A police-involved death shall be immediately reported to the Chief Medical Examiner by calling 1-800-870-8744 and the Investigation Division of the Attorney General's Office by calling 626-8520 or 626-8800. Representatives of the Investigation Division can be reached during evening and weekend hours by calling 582-4870 (Director of Investigations Brian MacMaster), or 582-6504 (Detective Bruce Densmore), or 623-1654 (Deputy Attorney General Fernand LaRochelle), or by calling 1-800-452-4664 (State Police Dispatch).

A police-involved death will be the subject of an investigation by the Department of the Attorney General for the purpose of determining legal justification.

The scene shall not be disturbed or the body moved until authorized by a representative of the Attorney General and the medical examiner unless the body is in immediate danger of destruction or further damage. Involved officers should be separated until the arrival of an investigator from the Department of the Attorney General. Members of the State Police Crime Lab or similar personnel from another agency dispatched under the authority of the Attorney General for the purpose of processing the scene shall be allowed access to the scene.

F. ***Workplace fatalities.*** The "workplace manslaughter" law became effective on September 30, 1989. 17-A M.R.S.A. § 203(1)(C). [P.L. 1989, C.505, §1] The law is applicable to those situations where an employee dies in the workplace. While not every death which occurs in the workplace is a "workplace manslaughter," all workplace deaths must be reported immediately to the Chief Medical Examiner by calling 1-800-870-8744.

The Chief Medical Examiner's Office will notify the Investigation Division of the Attorney General's Office, or you may notify the Investigation Division directly by calling 626-8520 or 626-8800. Representatives of the Investigation Division can be reached during evening and weekend hours by calling 582-4870 (Director of Investigations Brian MacMaster), or 623-1654 (Deputy Attorney General Fernand LaRochelle), or by calling 1-800-452-4664 (State Police Dispatch).

While the initial scene investigation of a workplace death will continue to be the responsibility of the agency normally providing law enforcement services in the particular locale, any prosecution under the workplace manslaughter law will be brought by the Attorney General's Office. Moreover, depending on the circumstances, investigators from the Attorney General's Office may be assigned to assist in the investigation of these matters. It is also likely that investigators from the Occupational Health and Safety Administration (OSHA) or the Maine Bureau of Labor Standards (BLS) will be assigned to assist in the investigation. In the initial scene investigation of these matters, officers are reminded to treat the situations like they would a vehicular manslaughter, securing photographs, measurements, and other evidence.

G. ***Child deaths.*** This section supersedes the memorandum of this office dated July 8, 1992, concerning this topic. Currently, when law enforcement officers proceed to the scene of a child death and foul play is suspected, the officers follow this protocol as stated in Sections II and III above. That practice should continue.

Additionally, however, after discussions with the Office of the Chief Medical Examiner, it has been decided to expand the scope of instances where a thorough scene investigation will be conducted in an attempt to determine the cause, manner and circumstances of the death of a child. A "child," for these purposes, is a person under the age of three years. The authority of the Medical Examiner in these cases is granted pursuant to statute. 22 M.R.S.A. §§ 3025 and 3028.

Effective immediately, the investigation of child death cases will be expanded beyond those situations of suspected criminal involvement. In addition to those suspicious child deaths that merit a criminal investigation, two additional categories of child deaths are included for special investigation:

1. Cases in which the cause of the child's death is not apparent. All of these will be specially investigated.

2. Selected trauma cases. The decision to specially investigated these cases will be made on a case-by-case basis by the Medical Examiner's Office.

If the decision is made to specially investigate a particular traumatic death, the Office of the Chief Medical Examiner will notify the appropriate investigating agency. The scene should continue to be protected until a representative from that agency arrives.

If the decision is made <u>not</u> to specially investigate a particular traumatic death, the responding officer will be notified by the Office of the Chief Medical Examiner so that the scene need no longer be protected. Of course, an appropriate routine level investigation is still necessary as in any medical examiner case of non-natural death.

The purpose of the investigation, special or routine, in each case is to determine, to the extent possible, the cause, manner and circumstances of the child's death. Deaths of young children are being singled out for special investigation because of the different technical approach and types of inquiry needed in pursuing them.

It is important for the first responding law enforcement agency to also protect the scene in the two types of cases enumerated above, as would be done in instances of suspicious death, until a decision is made concerning the need for a special investigation.

INVESTIGATION OF DEATHS

Office of the Chief Medical Examiner	1-800-870-8744
State Police Dispatch, Augusta	1-800-452-4664

SPECIAL CIRCUMSTANCES

FIRE DEATHS

State Fire Marshal	Call State Police Dispatch @ 1-800-452-4664

HUNTING DEATHS

State Warden Service	Call State Police Dispatch @ 1-800-452-4664

POLICE-INVOLVED DEATHS

Attorney General Investigations	626-8520 or 626-8800
Evenings or Weekends, call	Brian MacMaster @ 582-4870 Bruce Densmore @ 582-6504 Fern LaRochelle @ 623-1654

WORKPLACE DEATHS

Attorney General Investigations	626-8520 or 626-8800
Evenings or Weekends, call	Brian MacMaster @ 582-4870 Fern LaRochelle @ 623-1654

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POLICE-INVOLVED DEATHS

Definition. A "police-involved death" means a death resulting from a law enforcement officer's action. Not included, however, is any motor vehicle fatality unless it results from the imposition of non-deadly or deadly force by a law enforcement officer, to include high speed chases and police roadblocks.

Authority. State law provides that the Attorney General shall have full responsibility for the direction and control of all investigations and prosecution of homicides. 5 M.R.S.A. §200-A.

Policy. A police-involved death shall be immediately reported to the Chief Medical Examiner's Office by calling 1-800-870-8744 and the Investigation Division of the Department of the Attorney General by calling 626-8520 or 626-8800. Representatives of the Investigation Division can be reached *during evening and weekend hours* by calling:

582-4870	Brian MacMaster, Director of Investigations
582-6504	Bruce Densmore, Detective
623-1654	Fernand LaRochelle, Deputy Attorney General
1-800-452-4664	State Police Dispatch

A police-involved death will be the subject of an investigation by the Department of the Attorney General for the purpose of determining legal justification. Investigators from the Department of the Attorney General will be assigned to conduct the investigation of a police-involved death.

The scene shall be preserved and officers involved in the shooting separated by available law enforcement officials until the arrival of an investigator from the Department of the Attorney General, or his designee, who will be responsible for coordinating the death investigation and the processing of the scene. The scene shall not be disturbed or the body moved until authorized by a representative of the Attorney General and the medical examiner unless the body is in immediate danger of destruction or further damage. Members of the State Police Crime Lab or similar personnel so designated and dispatched under the authority of the Attorney General for the purpose of processing the scene shall be allowed access to the scene.

During the course of the Attorney General's investigation, no member or representative of the subject law enforcement officer's department will be present during interviews of the officer except in those circumstances where the officer requests or consents to the presence of a member or representative of his department and, even then, only after it has been clearly explained to the officer that the interview is being conducted pursuant to a criminal investigation by the Department of the Attorney General, and that the interview is not in any way associated with an administrative or internal affairs investigation. In the event that a member or representative of the officer's department is present for an interview, he or she will not in any way participate in the interview, but act merely as an observer.

No member or representative of the subject law enforcement officer's department will issue any order of any type concerning whether the officer should or should not talk with an investigator from the Department of the Attorney General.

Press releases regarding determinations of the subject officer's legal justification or criminal liability shall issue only from the Department of the Attorney General. It is important, also, that press releases in other regards, particularly with respect to the facts of a particular situation, be coordinated with the Department of the Attorney General. Release of the name of the subject officer will, when at all possible, be postponed until the officer and the Chief of the officer's department have been notified that such information will be released. As in any case, the name of a decedent will not be released until the family or next of kin has been notified.

Questions about these procedures may be addressed by contacting Brian MacMaster, Director of Investigations, Department of the Attorney General, State House Station 6, Augusta, Maine 04333, telephone 626-8520.

Dated: June 1, 1993

MICHAEL E. CARPENTER
Attorney General

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COLLECTION AND PRESERVATION OF PHYSICAL EVIDENCE

QUICK REFERENCE PAGE

BLOOD AND BODY FLUIDS 26
1. Immovable objects 26
2. Movable objects 26
BLOODSTAIN PATTERNS 24
1. Photographing bloodstain patterns 24
BULLETS AND CASINGS 39
1. Spent bullets and casings 39
2. Rounds of ammunition 40
CLOTHING 26
FINGERPRINTS 29
1. Adhesive tape 29
2. Paper products 29
3. Small items 30
4. Medium sized items 30
5. Large items 31
FIREARMS EVIDENCE 37
1. Handgun 38
2. Shoulder weapon 39
FOOTWEAR AND TIRE IMPRESSIONS 32
1. Photographing footwear and tire impressions 32
a. Two dimensional impressions 33
b. Three dimensional impressions 34
2. Collection of suspect footwear and tire impressions . 35
GLASS 27
HAIRS AND FIBERS 27
KNOWN SAMPLES (STANDARDS) 28
MISCELLANEOUS TRACE EVIDENCE 28
PAINT 27
TOOLS/TOOL MARKS 40