



ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY



Pouch Y, State Capitol
Juneau, Alaska 99811
(907) 465-3991

March 15, 1983

NCJRS

MEMORANDUM

NOV 24 1986

To: Representative Bob Bettisworth
From: Leonard Steinberg, Research Staff
Re: Organizational Location of Crime Lab
Research Request 83-101

L.S. ACQUISITIONS

Ralph Bennett of your office requested information on where within the governmental structure of other states criminalistics laboratories are located. He also asked us how other states protect the independence of the laboratories. Several states, national criminalistics organizations, and academic experts were contacted; our findings are summarized below.

Findings

While most states have criminalistics laboratories, there is considerable diversity in the location of these institutions within the structure of state governments. Many labs are part of state police organizations. In other states, the labs are in a separate division but still within the same department as the state police. Labs have also commonly been located under the auspices of the Attorney General. Though more unusual, some labs have been incorporated into state health departments, and at least one state has consolidated all state laboratories in one division within their Department of General Services. In addition, at least one state has a crime lab system completely independent from any other state agency.

In our interviews three primary arguments were made for not placing a laboratory under the auspices of a state police organization. First, charges of laboratory bias and insufficient credibility appear to diminish with greater laboratory independence. Some states allow criminal defendants access to state crime labs, in part, to prove the objectivity of the labs. Second, laboratories within police organizations sometimes have failed to effectively compete for limited government funding. Third, laboratories within police organizations may fail to attract and retain high quality personnel because: a) pay and benefits are generally lower than the uniformed officers they work under; b) lab employees lack promotional opportunities as only sworn officers are usually admitted into the leadership ranks of police organizations; and c) lab employees consider themselves scientists and prefer a less structured and more academic environment than is usually found within police organizations.

103770

103770

Representative Bob Bettisworth
March 15, 1983
Page Two

The primary argument in favor of locating crime labs in a police unit is increased responsiveness to law enforcement needs. Additionally, some experts feel that there are fewer problems with the security and confidentiality of criminal evidence when crime labs are within police organizations. Last, some experts feel that being in a police department will allow better working relationships to be built between scientists and police officers.

Alaska

Anchorage District Attorney Victor Krumm did not think that placing the lab within the State Trooper's organization would create a credibility problem. Mr. Krumm pointed out that many states have labs associated with their law enforcement organizations. He added that the nation's most respected lab is part of the Federal Bureau of Investigation (FBI).

American Academy of Forensic Sciences

Ken Field is the Executive Director of the American Academy of Forensic Sciences (303/596-6006), a professional organization of forensic scientists. According to Mr. Field, the credibility of criminalistics labs increases as the labs become more independent of law enforcement organizations. Field said that police labs in general have a poor reputation; too often, according to Field, non-scientists are placed in charge of police labs resulting in inappropriate management decisions and the closing off of promotional opportunities for lab employees.

Mr. Field stated that the ideal structure would be to have labs as part of the court system. At the very least, Field suggested setting up the crime lab as a division separate from the State Troopers within the Department of Public Safety.

American Society of Crime Laboratory Directors (ASCLD)

Jerry Chisum (209/576-6215), is the current president of ASCLD, acknowledged that police labs are often accused of bias. According to Chisum, the desires of a police captain or lieutenant too often take precedence over the judgment of a civilian laboratory director.

In California, where Mr. Chisum is employed, there are many crime labs which are part of local county sheriff's offices. Additionally, there is a state wide system of 15 crime labs that are part of the California Department of Justice. Mr. Chisum has worked in both systems and stated a strong preference for working under the Attorney General.

**U.S. Department of Justice
National Institute of Justice**

This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the National Institute of Justice.

Permission to reproduce this copyrighted material has been granted by
Alaska State Legislature

to the National Criminal Justice Reference Service (NCJRS).

Further reproduction outside of the NCJRS system requires permission of the copyright owner.

Representative Bob Bettisworth
March 15, 1983
Page Three

He also pointed out that some states have crime labs within their health departments. This practice apparently began with the need to perform certain homicide related medical examinations. However, Mr. Chisum noted that health department labs are almost invariably run by medical doctors and are generally poorly equipped and staffed to deal with non-medical procedures.

Southwestern Institute of Forensic Sciences

The Southwestern Institute of Forensic Sciences, a criminalistics laboratory in Dallas Texas, is an independent Dallas County agency. Mr. Irving Stone, Chief of the Physical Evidence Section (214/638-9982), stated that while the Institute performs work for all city and county police in their area, it is not under the supervision of any law enforcement unit. The Institute reports directly to the elected county commissioners.

According to Mr. Stone, the benefits of being an independent agency are less competition for funds and better credibility in court. Stone suggested placing the crime lab under the authority of the Attorney General.

California State Crime Labs

Mr. Al Biasotti, (916/739-5484) a manager of the California Department of Justice's Bureau of Forensic Sciences, stated that labs attached to police organizations always have problems of bias. According to Biasotti, independent labs can attract better personnel because the "forensic scientist" strongly prefers being independent of a law enforcement agency.

The California Department of Justice has had a state crime lab since the 1930s, and in the early 1970s, the system was expanded to 15 facilities. Attached as Appendix A are standards and other information California has used to establish its state crime labs.

Illinois State Crime Labs

Mr. Bruce Van der Kolk, (217/782-4975) is Director of the Bureau of Scientific Services, Illinois Department of Law Enforcement. The Department of Law Enforcement was created through governmental reorganization in 1977. The Law Enforcement Department also includes the bureaus for the state police, state investigators, internal investigators, and administration. The crime labs in Illinois, therefore, are in the same governmental unit as the police, but are not part of the police organization.

Representative Bob Bettisworth
March 15, 1983
Page Four

Prior to the 1977 reorganization, Illinois' crime labs independently defended their own budget before the Illinois legislature. According to Mr. Van der Kolk, the crime labs were not successful competitors with other state organizations for budget dollars. Since the 1977 reorganization, the Department of Law Enforcement has been more successful in getting state funding for the crime labs.

Mr. Van der Kolk argued that credibility is not the primary reason for maintaining the independence of crime labs. He maintained that the real reason is that scientists and police officers have difficulty understanding each others needs. Illinois has tried to have a sworn liaison police officer attached to every lab, but Mr. Van der Kolk is not convinced that this program has been successful. Mr. Van der Kolk explained that differences between sworn police officers and civilian lab employees in pay structure, benefits, and promotional opportunities exacerbates their differences.

Wisconsin State Crime Lab

According to Crime Laboratory Bureau Director Dan Dowd (608/266-2031), about 15 years ago Wisconsin's crime lab was transferred from the University of Wisconsin to the Law Enforcement Services Division of the Wisconsin's Department of Justice. Other Law Enforcement Services Division sections include a crime information group (records and statistics) and the training and standards section.

Mr. Dowd supports the location of the crime lab within the Attorney General's office; none of the other employees there are sworn officers nor has there been competition for funds. He speculated that the crime lab has fared better as an arm of the Attorney General than it would have on its own.

According to Mr. Dowd, crime labs have more in common with academic than with police institutions. He perceives the lab more as a friend of the court than as an advocate. In fact, Wisconsin statute allows defendants access to the lab and Mr. Dowd feels this helps the lab avoid charges of bias. Dowd says the lab is well respected by defense counsel even though less than 5 percent of its work is for defendants. The Wisconsin crime lab statutes are attached as Appendix B.

Arizona Crime Lab

The state crime lab in Arizona is part of the Criminal Justice Support Bureau of the Department of Public Safety. The Department of Public Safety was created in 1969 by merging many existing agencies including the highway patrol, narcotics and investigations, and operations bureaus. Cliff Van der Ark with the Arizona crime lab(602/262-8395) stated

Representative Bob Bettisworth
March 15, 1983
Page Five

that his lab has not experienced credibility problems. One advantage of being part of a police organization, according to Mr. Van der Ark, is maintaining security. However, he mentioned that the same respect for the security of criminal evidence is likely to exist in an Attorney General's office.

Alabama Crime Lab

The crime lab system in Alabama (10 labs) is a completely independent state agency. Taylor Noggle (205/887-7001) stated that in 1935 the legislature created a full service crime lab that also handles all autopsy functions traditionally performed by medical examiners. The crime labs in Alabama are not connected to their state police nor their attorney general's office. The Director of the Alabama crime lab is appointed by the Attorney General, but cannot be removed except by impeachment; since 1935, the crime lab has had only three directors.

According to Mr. Noggle, the credibility of Alabama's labs can be traced to the high quality of lab staff. Mr. Noggle said that Alabama has been able to retain qualified personnel due to a relatively high pay scale and promotional opportunities.

Alabama's lab analyzes evidence for both prosecutors and defendants. However, Mr. Noggle estimated that less than 1 percent of the lab's work was performed for defendants.

Virginia Crime Lab

Warren Johnson, Director of Virginia's crime lab, stated that Virginia is the only state that has consolidated all state laboratories into a single government unit. The crime lab, together with the health, environmental, and consumer protection labs, make up the Division of Consolidated Laboratory Services within the Department of General Services. This organizational structure was created in 1972 to reduce costs (shared equipment and space) and increase effectiveness (sharing expertise).

Despite these theoretical gains, Mr. Johnson feels that the consolidation approach has been unsatisfactory. In fact, little equipment or space is shared because of the crime lab's need to insure the security of criminal evidence. Mr. Johnson said that there is only one piece of equipment that is regularly shared with other labs. Additionally, he expressed concern that the crime lab is left out of all planning for the criminal justice system because all other law enforcement agencies are in a different department. However, Mr. Johnson did acknowledge the usefulness of having easy access to the scientific experts associated with the other laboratories. In conclusion, he does not recommend the consolidated laboratory approach, but does recommend crime labs be independent from police organizations.

Representative Bob Bettisworth
March 15, 1983
Page Six

Academic Experts

Dr. Joe Peterson (312/996-8585), is with the Center for Research in Law and Justice at the Chicago campus of the University of Illinois. Dr. Peterson's professional research interests are in how science is used in the legal system and he is particularly knowledgeable about crime laboratories. According to Dr. Peterson, there is consensus among criminalist professionals that it is undesirable to place a crime lab within a police organization. Dr. Peterson stated that statistically, the labs located in law enforcement agencies often are unable to compete with the police organizations for money and are not as well respected by crime lab professionals as are labs independent of law enforcement agencies.

Though the issue of credibility is often raised when a lab is associated with a police unit, Dr. Peterson stated that there has never been a quantitative study of the problem. Though Dr. Peterson prefers labs that are completely independent of police organizations, at the very least, he suggests giving the lab the same status in government as other law enforcement units such as the Troopers. Dr. Peterson also suggested that the lab's credibility would be aided by allowing defendants equal access to the lab's procedures.

Dr. John Thornton (415/642-1605), University of California, Berkeley, assisted the State of California in developing its state crime lab system in the early 1970s. Dr. Thornton agreed that credibility is a serious issue and noted that charges of bias and perjury do affect the outcomes of criminal cases. For these reasons, Dr. Thornton feels it is essential that labs have an independent reputation. He said that the management of crime labs by the California Attorney General has worked out well.

Dr. Thornton feels that if a lab is placed within a police organization, it is essential that the lab director be a scientist and not a police officer. Dr. Thornton noted that scientists and police officers have different approaches to proof. Police officers generally have very different backgrounds from the lab scientists and often do not fully understand the equipment and procedures used in crime labs.

* * * * *

We hope this information is helpful to you. Many of the experts we spoke with promised to send us additional information in the mail and we will forward these materials to you as soon as we receive them. Please let us know if we can provide you with any additional assistance.

LS/sj

Attachments

ATTACHMENT A

Crime Laboratory: Standards and Goals

State of California

DEPARTMENT OF JUSTICE

PHYSICAL EVIDENCE MANUAL

JAN 1973
WASH. D.C.

STANDARD 12.2

THE CRIME LABORATORY

Every State should, by 1982, establish a consolidated criminal laboratory system composed of local, regional, or State facilities capable of providing the most advanced forensic science services to police agencies.

1. Every police agency should immediately ensure that it has access to at least one laboratory facility capable of timely and efficient processing of physical evidence and should consider use of each of the following:
 - a. A local laboratory that provides analysis for high volume, routine cases involving substances such as narcotics, alcohol, and urine; routine analysis and processing of most evidence within 24 hours of its delivery; immediate analysis of certain types of evidence, such as narcotics, where the detention or release of a suspect depends upon the analysis; and qualitative field tests and quantitative follow-up tests of narcotics or dangerous drugs.
 - b. A regional laboratory (serving an area in excess of 500,000 population where at least 5,000 Part I offenses are reported annually) that provides more sophisticated services than the local laboratory, is situated within 50 miles of any agency it routinely serves, can process or analyze evidence within 24 hours of its delivery, and is staffed with trained teams of evidence technicians to assist in complex investigations beyond the scope of local agencies.
 - c. A centralized State laboratory that provides highly technical analyses which are beyond the capabilities of local or regional laboratory facilities.
2. Every crime laboratory within a police agency should be a part of the organizational entity which includes other support services, and should be directed by an individual who reports only to the agency's chief executive or to a staff authority who reports directly to the chief executive.
3. In maintaining a staff of formally qualified personnel who can provide efficient and reliable assistance in criminal investigations, every crime laboratory should provide that:
 - a. Every employee responsible for the completion of scientific analyses or testing hold at least an earned baccalaureate degree in chemistry, criminalistics, or a closely related field from an accredited institution, and have a thorough working knowledge of laboratory procedures;
 - b. Every employee performing supervised basic scientific tests or duties of a nonscientific nature meet the agency's requirements for the employment of regular sworn or civilian personnel;
 - c. The laboratory director be familiar with management techniques necessary to satisfactorily perform his administrative functions;
 - d. All laboratory personnel be adequately trained and experienced;

For Notes

A. A. Biasotti
Manager-Criminalist

Department of Justice
Bureau of Forensic Services
349 Broadway
Sacramento 95820

(916) 739-5484
ATSS 497-5484

State of California



POLICE

For Notes

- e. Civilian personnel be used regularly so that sworn personnel may be more appropriately deployed in other assignments but provide that qualified sworn personnel be used when their abilities or expertise cannot be found elsewhere;
 - f. The working staff be sufficient to meet the demands of the laboratory caseload;
 - g. Salaries be commensurate with the specialized duties and qualifications of each position so that well qualified personnel are attracted to and retained in these positions;
 - h. Promotional and career paths for laboratory personnel result in salaries at least equal to those of persons employed in other equivalent laboratories; and
 - i. A clerical pool capable of handling all of the clerical needs of the laboratory be maintained.
4. Every laboratory which employs more than 10 nonclerical personnel should also establish at least one research position for solving specific laboratory problems and developing new laboratory techniques.
 5. Every police chief executive should ensure that the police laboratory function receives appropriate fiscal support and that the adequacy of its facilities is considered in structuring the agency's annual budget; every laboratory director should be able to assess and control the amount, type, and quality of evidence received by the laboratory.
 6. Every police agency laboratory and every regional laboratory should receive from all agencies using its services partial annual support based upon the number of sworn personnel employed by each agency, rather than on case costs.
 7. Every crime laboratory director should, by 1974, design and implement a reporting system that provides data relative to its involvement in:
 - a. Reported crimes;
 - b. Investigated crimes;
 - c. Suspects identified or located;
 - d. Suspects cleared;
 - e. Suspects charged;
 - f. Prosecutions;
 - g. Acquittals; and
 - h. Convictions.
 8. Every crime laboratory should immediately establish close liaison with:

POLICE

For Notes

- a. All other elements of the criminal justice system to ensure that laboratory findings are consistent with law enforcement needs and are being effectively used as investigative tools;
- b. The scientific and academic establishments to insure use of the latest techniques and devices available to the criminalist and the investigator.

Commentary

12.2(1) Minimum Police Laboratory Needs. The gathering of physical evidence at a crime scene will do little to improve the investigative process unless such evidence is translated into pertinent data related to the crime. Thus, no matter how sophisticated an agency's evidence collection methods, they are of limited value without a comparable system of evidence analysis. There should be available to every police agency a laboratory facility capable of providing qualitative, quantitative, and interpretive analyses of all physical evidence taken into custody by the agency.

Time is often critical in a criminal investigation, and the solution of a case may hinge upon the rapid return of information to an investigator. Therefore, the laboratory facility should be capable of immediate analysis of evidence. On the other hand, some evidence may not demand immediate handling and may be returned to the agency on a routine or scheduled basis. The important thing is that the laboratory realize the difference and set up priorities to insure the speedy return of evidence when indicated. As a general rule, the return of evidence should be timely and should depend upon the needs of the agency's investigators.

To insure the timely return of physical evidence, it is imperative that all agencies establish procedures to facilitate the movement of evidence through the investigative, analytical, and judicial processes. Too often, an item is delayed at some point in the system until its value is reduced or completely lost. While procedures should provide for the smooth flow of evidence through the system, it is of much greater importance that the continuity of the evidence be maintained during its movement. Agencies should ensure that the evidentiary chain remains intact as evidence passes from the evidence technician, through the property clerk, chemist, and investigator, to the court clerk. In order to maintain its validity in the criminal process, evidence must be accounted for at every stage of its progress. Therefore, each person handling the evidence, for whatever purpose, should be required to sign for its release and its return.

A police agency should also have easy access to a laboratory facility which can provide services consistent with the techniques most often used by that agency. In essence, the laboratory must have the staff and equipment to perform those analyses of most frequent concern to its clients. Most agencies will require laboratory services for document examinations, drug analyses, and the identification of firearms, tool marks, and trace evidence. However, an agency whose primary functions are traffic enforcement and accident investigation may have a fairly exclusive need for blood alcohol tests, urinalyses, or spectrographic examinations of paint chips. Agencies with helicopter fleets may similarly have need of specialized photographic materials and equipment. The laboratory, especially at the local level, should be prepared and equipped to meet these varying analytical needs of the agencies it serves.

12.2(1a) Local Laboratory. The President's Commission on Law Enforcement and the Administration of Justice in its 1967 *Task Force Report: The Police*, stated that a "good laboratory facility is beyond the means of almost all police departments in the United States." The Commission cited a lack of facilities and a shortage of qualified technicians as reasons for its

For Notes

conclusion. However, despite such obstacles, most police agencies were unwilling to give up their laboratories, even when they were not used effectively. The reluctance of some agencies to surrender their facilities might disappear if each were required to provide a minimum level of service at the local level. In view of these conditions, police agencies should be cautioned against attempting to create laboratory facilities when appropriate facilities are already at their disposal.

A local laboratory may be defined as a facility operated by a local police agency to provide laboratory services for that agency or other agencies in the immediate vicinity. The local laboratory should *at least* provide routine analyses of narcotics, blood, breath, and urine. These are usually high volume services, and some laboratory directors are concerned that accepting case work of this nature will totally involve the laboratory in minor analyses. An alternative to the use of local laboratories for such purposes is an expansion of the role of the field policeman. In the Los Angeles Police Department, officers conduct breathalyzer examinations on drunk driving suspects prior to booking. Such fairly simple examinations as the breathalyzer test and the narcoiban test for drugs may be administered in the field or the station to ease the burden on the laboratory. Blood alcohol, urinalysis, and Naline examinations must be conducted in the laboratory.

It is, of course, acknowledged that the local laboratory should provide accurate and reliable information to investigators, but the "turnaround" time for evidence submitted to the laboratory is often a controversial issue. Most items of evidence presented to the local laboratory should be processed and evaluated within 24 hours of delivery. More time for the delivery of routine services would negate the advantages of the local laboratory's convenience. As a matter of fact, there are certain instances when immediate evidence analysis should be provided.

The detention or release of a narcotics suspect often hinges upon the positive identification of the evidence as a narcotic or dangerous drug. In such cases, when a field narcoiban test or similar examination is unavailable to the field officer, the laboratory should immediately analyze the evidence. As another means of preventing a backlog or congestion in the laboratory, laboratory personnel may be deployed to administer qualitative field tests in narcotics cases. Since field tests for narcotics have proved invalid in some instances, such tests should be used only when they have clearly demonstrated their reliability.

The President's Crime Commission in 1967 reported that the Chicago Police Department operates one of the best-equipped and staffed facilities in the country. In 1965, the Chicago laboratory processed materials for 140 jurisdictions, including Federal and State agencies, counties, and other municipalities. Obviously this operation fulfills much more than the minimal requirements for a local facility. The important fact is that its returns are the most advantageous in terms of proximity, timeliness, and quality for those agencies which avail themselves of its services. Thus, with no regional or State facilities readily available many agencies have chosen Chicago's laboratory as one whose scientific capability can meet the full range of their laboratory needs. The opposite situation exists in Los Angeles, where the city and county agencies each operate a local laboratory facility within three blocks of one another. While each provides quality services, the duplication of facilities is a situation which should be avoided. It wastes manpower, equipment, and operating resources.

12.2(1b) *The Regional Laboratory.* A 1966 study by the Department of Justice revealed that 17 States had no crime laboratory within their boundaries. The scarcity of local laboratories, properly trained laboratory personnel, and adequate space and equipment has fostered growth of the regionalization concept in police laboratory services. To avoid duplication of services and to maintain quality standards, it is generally believed that regional laboratories should be controlled

POLICE

For Notes

and operated as part of a statewide system. A regional laboratory should be equipped to perform all but the most highly specialized types of analyses connected with criminal investigations. It should certainly provide a more sophisticated level of service than the local laboratory, although it may function as a local facility for agencies in its immediate area.

A 1966 report by John Jay College (New York City) recommended that a regional crime laboratory be established to serve from 500,000 to 1 million persons in an area where at least 5,000 Part I crimes are committed each year. This recommendation was made to insure the existence of a sufficient caseload to justify the operation of a full-service regional facility. The FBI's annual publication *Uniform Crime Reports 1971*, reveals that well in excess of 10,000 index crimes occur annually when the population approximates one-half million persons. Therefore, John Jay's guidelines are quite liberal as indicators of the need for a regional laboratory.

Past experience indicates that police investigators will rarely seek laboratory assistance when the facility is inconveniently located. There are areas where the technician or investigator must travel an unreasonable distance to obtain laboratory services. This situation should be remedied so that laboratory assistance is available wherever and whenever it is needed. Studies have shown that evidence submission decreases sharply as the distance of the crime scene from the laboratory increases. A 1970 report by the Midwest Research Institute projected criminalistics requirements for eight adjoining counties in Missouri and Kansas. This report recommended locating a regional laboratory at a site within a 20 mile radius of 90 percent of the subscribing agencies' sworn personnel and 96 percent of the crimes committed in the region. While probably a valid guideline for this particular region, the 20 mile radius would present problems in larger, less populated western and southern States. A more realistic criterion would dictate that a regional laboratory be normally located within 50 miles of any agency which it routinely serves.

To provide a complete range of services and timely return of results, a laboratory should provide 24-hour-a-day service to its clients when necessary. Although around-the-clock deployment is obviously desirable, it presents some complex problems which must be weighed against the benefits. Qualified laboratory staff members are aware of their scarcity and the demand for their services. Consequently most choose to work regular daytime hours and usually get their way. Those who would agree to a night or morning watch would probably rebel when they were subpoenaed to court during their off-duty hours. Although a situation which has faced police officers for years, it is highly unlikely that predominantly civilian laboratory staffs will voluntarily accept such conditions. The only feasible solution to such a problem appears to lie in an increased liaison with the criminal courts to devise operational methods which will decrease wasted man-hours and increase the effectiveness of the system.

In considering the regional laboratory system, police chief executives should examine laboratory facilities already in existence. Some public safety laboratories function as police crime laboratories and process evidence connected with violations of antipollution and other noncriminal laws. The duties of some professions include the operation of full-service laboratories. In many instances, the laboratories run by medical examiners, coroners, and pathologists may be used as regional police laboratories. The laboratory of the coroner in Hamilton County, Ohio, functions as the crime laboratory for local police agencies in the Cincinnati area.

Finally, the regional laboratory may, as the need arises, provide trained evidence technicians to local agencies which lack the expertise to conduct complex crime scene investigations. In Dallas, Texas, evidence technicians, under the direction and control of the medical examiner are assigned to the criminal investigation laboratory to carry out regular crime scene investigations. The laboratory is operated independently of the police agency and the technicians work in a scientific

POLICE

For Notes

atmosphere of neutrality not always present in a police facility. An expansion or modification of such a program could provide local agencies with the assistance needed.

12.2(1c) **The Centralized Laboratory.** Police agencies often need laboratory support which cannot be supplied at either a local or a regional level. When a criminal investigation requires a highly technical, time-consuming, or singularly unique analysis, a central laboratory should be available to provide such service. The need for such a facility is emphasized by the volume of scientific examinations performed annually by the FBI laboratory in Washington, D.C. While the FBI laboratory serves a useful purpose in providing free services to a multitude of local, State, and Federal agencies, most agencies outside of the Washington, D.C. area are too far removed to receive timely service.

If each State were to provide services comparable to those of the FBI laboratory, more agencies would be likely to submit evidence for analysis and the return of examination results would be speedier. These centralized State laboratories should be capable of performing all complex scientific evaluations necessary in police work at no charge to participating agencies. They should also train laboratory technicians.

12.2(2) **Laboratory Organization.** Most local laboratories and some regional facilities function as elements of police agencies. Some police administrators and criminalists feel that this is an unsound administrative arrangement, particularly when services are provided for agencies other than the parent agency. Some feel that under such circumstances the laboratory may be operated by personnel with very little knowledge of criminalistics or laboratory administration. Others cite a danger of vested political interests influencing the local or regional operation of the laboratory and a resultant imbalance in the dissemination of services. All feel that a laboratory serving more than one jurisdiction must be objective in its administrative policies. The President's Commission on Law Enforcement and the Administration of Justice, in its *Task Force Report: The Police, 1967*, suggested that local regional laboratories be placed under the direction of the State laboratory system or some independent entity, such as a university or medical examiner. The Midwest Regional Institute also recommended that regional crime laboratories be kept separate and distinct from any existing law enforcement agency.

The fact remains that many successful laboratory operations are presently under the direction of either local, county, or State police agencies. To dissolve the organizational integrity of such facilities in order to restructure them as Statewide or independent systems would create chaos precisely where the police service can least afford any interruption of service. It would appear much more realistic to adopt measures to insure that these laboratories are operated efficiently without regard to the special interests of the agency or the concerned government.

A laboratory which exists within a police agency should function as a staff element of that agency, and should not be administratively responsible to any operational unit of the agency. The laboratory should not function as a tool of any investigative or patrol unit, although it will certainly act in a supportive capacity to both functions. It should be an element of whatever organizational entity provides similar support services. As the administrator of a staff element, the laboratory director should be accountable to the agency's chief executive. In large agencies which organize their support services under a specific bureau or division, the director should report to the commanding officer of that bureau or division. That commanding officer should, in turn, report to the chief executive. Where such a bureau or division does not exist the laboratory director should report directly to the chief executive.

POLICE

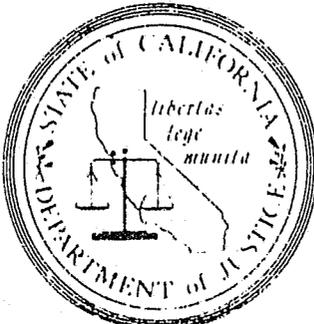
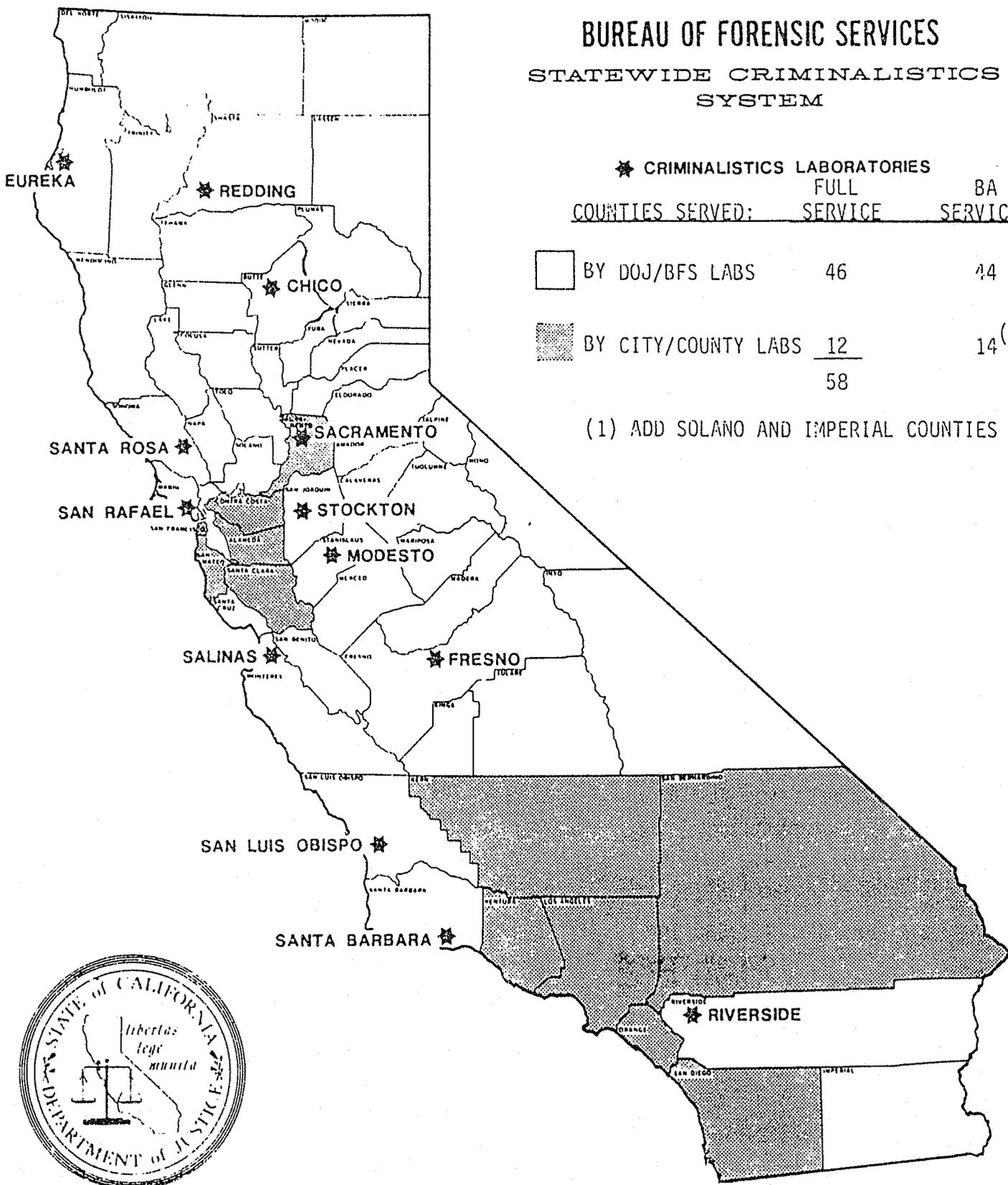
For Notes

References

1. Federal Bureau of Investigation. *Uniform Crime Reports - 1971: Crime in the United States*. Washington, D.C.: Government Printing Office, 1972.
2. *Forensic Sciences Resources Committee Report to Governor Milliken*. November 19, 1970.
3. Kingston, Charles R. "A National Criminalistics research program," in S. I. Cohn and W. B. McMahon (eds.), *Law Enforcement Science and Technology*, Vol. 3. Chicago: ITT Research Institute, 1970.
4. National Institute of Law Enforcement and Criminal Justice. "Planning Guidelines and Programs to Reduce Crime." U.S. Department of Justice, Law Enforcement Assistance Administration.
5. Parker, Brian, and Peterson, Joseph. *Physical Evidence Utilization in the Administration of Criminal Justice*. Washington, D.C.: U.S. Department of Justice, January 1972.
6. Pomerleau, D. D. "Model Standard, Utilization of Support Services, Civilian Laboratory Division." Baltimore: Baltimore Police Department, May 1972.
7. President's Commission on Law Enforcement and Administration of Justice. *Task Force Report: The Police*. Washington, D.C.: Government Printing Office, 1967.
8. President's Commission on Law Enforcement and Administration of Justice. *Task Force Report: Science and Technology*. Washington, D.C.: Government Printing Office, 1967.
9. Ritter, L. E. "The Scientific Investigation Program of the Los Angeles Police Department." Position Paper, 1972.
10. "A Study to Determine Criminalistics Support Requirements for the Law Enforcement Agencies Located in Buchsman, Platte, Clay, Jackson, and Cass Counties in Missouri and Leavenworth, Wyandotte and Jackson Counties in Kansas," *Midwest Research Institute Report*, Final Report, August 14, 1970. MRI Project No. 3386-D.
11. Sullivan, Robert C., and Kevin P. O'Brien. "The Need for a Convergence of Effort in Modern Forensic Science." *Police*, May - June 1969.
12. Yefsky, S. A. (ed.). *Law Enforcement Science and Technology*, Vol. 1. Thompson Book Co., 1967.

BUREAU OF FORENSIC SERVICES

STATEWIDE CRIMINALISTICS SYSTEM



STATE OF CALIFORNIA
DEPARTMENT OF JUSTICE

EVELLE J. YOUNGER
Attorney General

CHARLES A. BARRETT
Chief Deputy Attorney General

DALE H. SPECK
Director Division of Law Enforcement

INVESTIGATIVE SERVICES BRANCH

ROBERT W. DRAKE
Assistant Director

PHYSICAL EVIDENCE
MANUAL

pub. August 1975

rev. May 1978

LOUIS MAUCIERI, VICTOR REEVE
KEITH SMITH
Editorial Coordinators

CONTENTS

I. Introduction.....	5
II. Investigative Services Branch.....	6
III. Branch Services and Functions	7
IV. Submission of Physical Evidence	8
V. Evidence Examination Reports	11
VI. General Instructions for the Collection and Preservation of Evidence	12
VII. Physical Evidence Studies Conducted by the Criminalistics Laboratory	14
A. Blood Stains	15
B. Seminal Stains	17
C. Fibers and Threads	18
D. Hair	20
E. Paint	22
F. Glass.....	24
G. Operating Condition of Lights.....	26
H. Plastic	27
I. Soil.....	29
J. Tool Marks.....	32
K. Firearms Evidence	34
L. Serial Number Restoration	37
M. Fire Investigation and Flammable Fluids.....	38
N. Explosions and Bombs	41
O. Controlled Substances	43
P. Blood Alcohol	44
Q. Driving With Drugs (DWD)	45
VIII. Latent Print Section	46
IX. Questioned Documents	48
X. Forensic Photography Section	53
XI. Polygraph Section	54
XII. Crime Scene Investigation.....	58
XIII. Information for District Attorney, other Prosecutors and Public Defenders	60
APPENDIX A—List of Physical Evidence Bulletins.....	62
APPENDIX B—Contacting the Investigative Services Branch	63

PHYSICAL EVIDENCE MANUAL

This newly revised edition of the Department of Justice Physical Evidence Manual is now available. The manual describes the recommended procedures for the collection and preservation of all types of physical evidence. Evidence studies conducted by the State Department of Justice Criminalistics Laboratories and other services available to qualified agencies of the State's Criminal Justice System are described and illustrated.

At least one free copy of the manual has been furnished to most criminal justice agencies relying on the Department's laboratory services. If additional copies are desired, they are available and may be purchased for \$2.75, tax included from—

Department of General Services
Documents and Publications
P. O. Box 1015 N. Highlands
Sacramento, CA 95660
Phone—(916) 445-1020

BRANCH OBJECTIVE

To Provide Scientific Services for the components
of the
California Criminal Justice System

PHYSICAL EVIDENCE

The term physical evidence embraces any and all physical objects or recorded observations and measurements of events which may aid the investigator or the court in reaching an opinion or conclusion. Such evidence may assist in:

1. Establishing that a crime has been committed (corpus delicti evidence).
2. Identifying, locating and apprehending the perpetrator of a crime (investigative evidence).
3. Connecting a suspect with a crime or crime scene (corroborative evidence).

I. INTRODUCTION

This manual has been prepared by the Investigative Services Branch (ISB) of the Department of Justice of the State of California with the following objectives:

- A. To inform California law enforcement concerning the services provided by ISB.
- B. To outline proper methods for collecting physical evidence.
- C. To indicate suitable methods for the submission of evidence to ISB.
- D. To indicate the value of physical evidence and expert testimony concerning evidence studies.
- E. To explain other special aid which ISB can furnish in the scientific evaluation of crime, accident, fire and other scenes and the assistance which can be rendered in the investigation and prosecution of legal cases.

So many types of physical evidence are involved in the investigation of crimes that it is not possible to describe in this manual all examinations conducted or the methods for collecting, marking or packaging every conceivable type. The suggested procedures concerning the more common types of physical evidence, however, can be applied to practically all exhibits which may be encountered. It is believed that the investigator who will use common sense and intelligence and follow the basic procedures suggested, should encounter little difficulty in properly collecting and preserving physical evidence so that its greatest value can be realized.

II. INVESTIGATIVE SERVICES BRANCH

The Investigative Services Branch is the branch of the Division of Law Enforcement that provides the scientific and technical examinations required by the Criminal Justice System. It is divided into two Bureaus, the Special Services Bureau and the Technical Services Bureau.

A. Special Services Bureau (SSB)

The SSB provides technical services in the fields of Questioned Documents, Latent Fingerprints, Forensic Photography and Polygraphy. The experts employed in these sections are all highly trained and educated in their special fields. Each is prepared and qualified to present expert testimony in court regarding his examinations.

The Special Services units are equipped with the latest proven equipment and instruments necessary to provide the highest level service attainable. The addresses and phone numbers of the Special Service Sections will be found in Appendix B.

B. Technical Services Bureau (TSB)

The TSB provides the criminalistics services for 44 of the 58 counties in the state, and assists upon request in the remaining counties. The addresses and phone numbers of the several laboratories will be found in Appendix B. The laboratories are divided by function into satellite and regional laboratories.

Satellite laboratories provide limited service, primarily blood alcohol and controlled substance analyses.

Regional laboratories provide complete criminalistics services, examining all types of physical evidence.

All levels of laboratories are staffed by professional criminalists, technical assistants, and stenographic employees. The criminalists are all college graduates holding degrees in criminalistics or related physical sciences. In addition, all have had specialized training and belong to various professional societies. All are prepared and qualified to present expert testimony before the courts in connection with the scientific studies which they undertake.

The laboratories are provided with the instrumentation and equipment necessary to provide the highest level service attainable.

The Central Resources Unit manages a number of branchwide service programs. Sections within this unit include the Applications and Training Office (coordination of method development and education), the Uniform Blood Alcohol Program (maintains professional standards for compliance to

Title 17 for blood, breath, and urine), the Driving Under the Influence of Drugs Program (provides blood and urine analyses for drug related traffic violations), the Gas Chromatograph/Mass Spectrometer Program (provides analytical support for drugs in driving, solid dosage drug analyses and criminalistics) and the Instrument Repair Program (provides repair and maintenance for breath testing equipment and laboratory instrumentation within the statewide system).

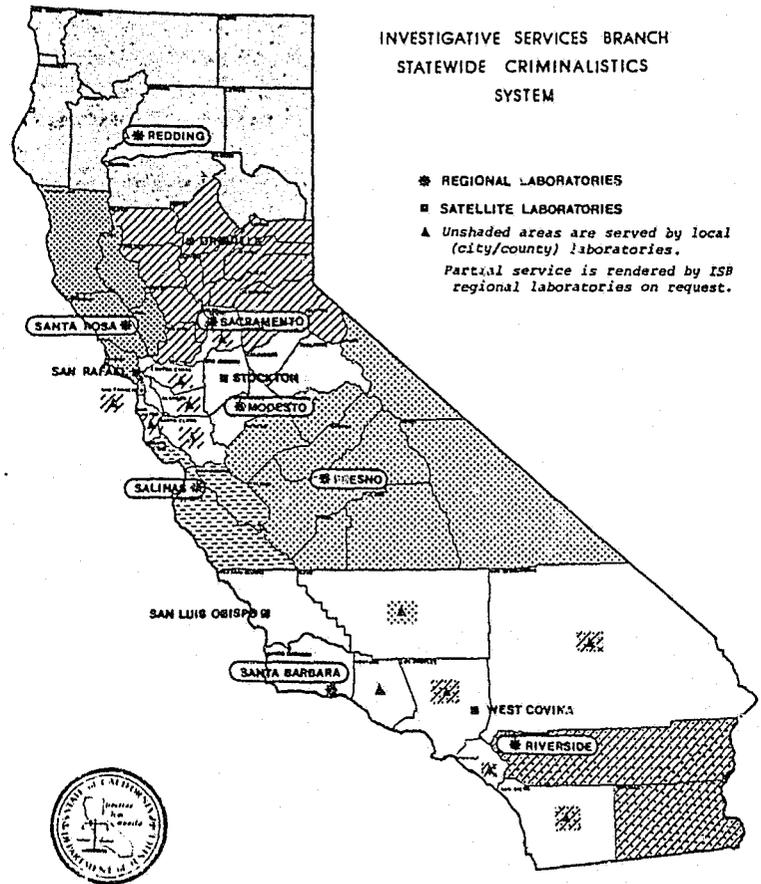


Photo 1A Location of Regional and Satellite Laboratories, Investigative Services Branch, Department of Justice, State of California.

III. BRANCH SERVICES AND FUNCTIONS

- A. Availability—The services of the ISB are available to all local and state law enforcement or investigative agencies in California, and, on a contractual basis, to all public defenders offices.
- B. Cases Handled—The purpose of the ISB is to render assistance in criminal investigation. While some cases handled may be found to be noncriminal in nature (such as certain accident, death or fire investigations) these must be incidences where the possibility of a criminal act is present. In the latter type of case it is essential that the investigation be part of the regular public duty of the requesting agency. No evidence studies may be conducted for private persons or corporations in either civil or criminal cases.
- C. Cost of ISB Services—All forensic services are generally available without charge to public agencies. This includes field or laboratory studies, testimony presented in courts and travel expenses. Exceptions which occur are those where special high cost equipment or supplies must be purchased or where special analyses must be referred to private corporations or individuals. Whenever such special charges will be incurred, prior approval will always be obtained through consultation with the submitting agency or district attorney.
- D. Functions of the Investigative Services Branch
1. Examine, identify, compare and interpret most types of physical evidence and interpret the significance of the findings.
 2. Furnish expert testimony before the courts concerning examinations conducted on evidence or related matters. When criminalists or other specialists are needed as witnesses in legal actions, official requests for such appearances should be made by the appropriate attorney. This should be done by subpoena, but a letter or teletype may be equally respected. On any official investigation conducted by an ISB employee he may, of course, be called as a witness by either the prosecution or public defender.
 3. Furnish field assistance in the investigation of major criminal cases. Such aid can only be furnished in connection with felonies of major importance or where special knowledge is essential to properly investigate the case. Requests for such assistance should be made only by the head of the investigative agency or by a supervising employee responsible for the conduct of the investigation. The official requesting a field investigation must inform the

laboratory of the type of crime, the basic circumstances surrounding the case and the specific type of assistance required. This is necessary to permit assigning the most qualified staff member available (see Section XIII for more details).

The ISB is not able to furnish on-the-scene assistance in routine investigations where trained officers are available to adequately recover evidence for later submission to the laboratory or section.

4. Render aid to prosecutors in connection with preparing scientific and technical phases of certain cases for trial. In some situations the ISB may also be able to furnish advice to prosecutors so that they may better understand the significance of testimony presented by other prosecution or defense experts.
5. Furnish instruction or audio-visual training aids concerning physical evidence for law enforcement training. Basic or specialized instruction will be furnished whenever possible to officers of any law enforcement agency. When such instruction is desired, a formal request should be made well in advance of the time scheduled. Requests for training school instructors should be made to the local regional laboratory or special section by the head of the law enforcement agency involved (see Appendix B for address).

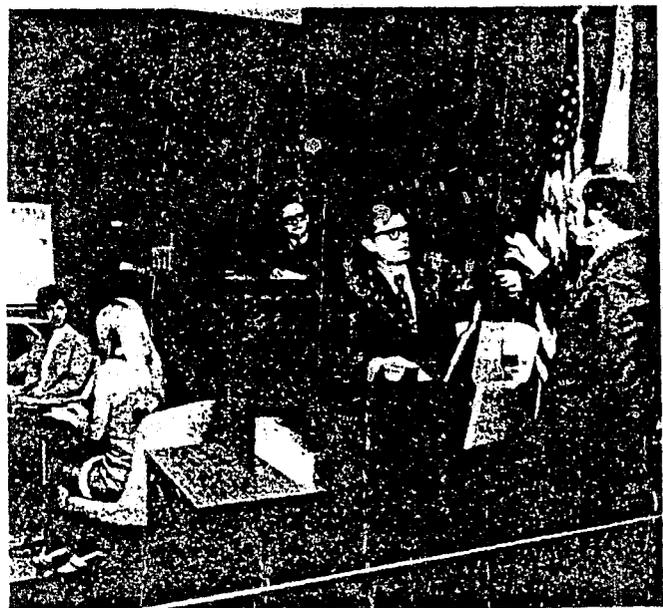


Photo 1B A Criminalist of the Investigative Services Branch presenting expert testimony to the court.

IV. SUBMISSION OF PHYSICAL EVIDENCE

A. Method Selection

Various methods can be employed to submit evidentiary material to the laboratory. Generally the method selected will depend upon the type and size of the exhibits involved, the time available for completion of analyses and the complexity of the case. Whatever the method employed, care must be taken to assure that evidence will not be lost, damaged or contaminated and that the chain of possession of the exhibits can be legally established and maintained.

B. Information Required

In every case a completely filled out ISB form (ISB-4) should accompany the exhibits submitted. If this form is not available a letter may be substituted which furnishes the following information:

1. Name of suspect or defendant, if applicable.
2. Name of victim, if applicable.
3. Specific type of crime involved.
4. Agency case number.
5. Agency submitting evidence.
6. Name of officer submitting evidence.
7. Name of officer to whose attention reports should be sent and/or evidence returned.
8. Itemized list of exhibits included.
9. Purpose of examinations or type of studies desired.
10. Copy of crime investigation, accident or autopsy report as appropriate or at least a brief summary of the specific case under investigation.
11. Notations concerning any accidental or intentional changes which the investigator has made in the exhibits.
12. If previously examined by another agency a copy of any reports received concerning such examinations.
13. ISB case number if evidence is being resubmitted or is additional evidence on a case that has already been analyzed by the ISB. Such case numbers appear on all exhibits and at the top of all reports, letters or other correspondence pertaining to evidence studies conducted by the ISB.

C. Personal Delivery

1. Best Method—Personal delivery of evidence is the best method in those cases where the investigation or the evidence involved is complex. It is also best when large or perishable exhibits are involved or there are many sen-

rate items.

2. Permits Personal Consultation—Discussion of the case and evidence by the investigator and the analyst is frequently beneficial, particularly in complex cases.
 3. Avoid Use of Messengers—Evidence should not be delivered by officers unfamiliar with the case under investigation who are only acting as messengers. Such persons normally do not have information about the investigation needed by the laboratory. In addition, such procedures add one more individual to the chain of possession and they will usually be needed to testify regarding such evidence possession if the case goes to trial.
 4. Contact the Laboratory or Special Service Section—Telephone whenever possible prior to personally delivering evidence. This is particularly important if the case is complex. It permits the Supervisor to arrange to have the most qualified personnel available when the officer arrives.
 5. Evidence Delivery Address—See Appendix B.
 6. Hours—8 a.m. to 5 p.m. The ISB is closed on Saturday, Sunday and holidays.
 7. Contacting Analysts During Non-Working Hours—Analysts can be contacted through the Bureau at any time but delays may occur. Therefore, if complex evidence must be delivered during non-working hours or field assistance is required, telephone first. See Appendix B for nights and weekend numbers.
- ### D. Mail Shipment
1. Postage Class—Use registered or certified mail if evidence is of high monetary value or if it is small and of critical value. Otherwise, first or fourth class mail is satisfactory.
 2. Prevent Damage—Package contents so that breakage or contamination will not occur during shipment.
 3. Restrictions—Follow postal regulations. Do not mail explosives and other prohibited items.
 4. Seal Package Completely—Even if fourth class mail is employed do not just tie with string but rather employ paper tape or other sealing tape.
 5. Place Letter on *Outside of Package*—Use Form ISB-4 or include all information listed under Item B in letter. Place this in an envelop and attach to the *outside* of the sealed package.

PHYSICAL EVIDENCE MANUAL

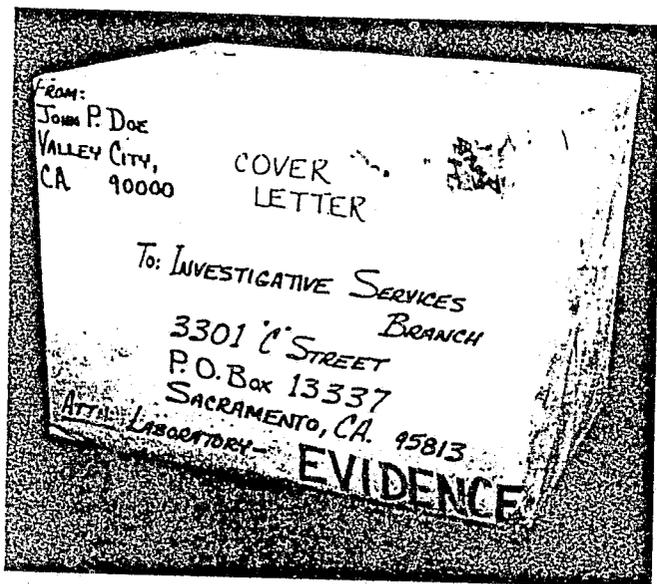


Photo 2 Proper method for packaging evidence for shipment. Always place a cover letter on the outside of the package.

This permits the laboratory to record the case and assign it to the appropriate scientist available for the specific examination necessary. Only the analyst assigned to the case will open the package. It also permits suitable storage of unopened perishable evidence when examinations must be delayed. In instances where there is need for obtaining the results rapidly it permits assigning priority to specific cases or exhibits.

6. Mail Address—See Appendix B.

7. Mark to Attention of Proper Section—In all cases mark package to the attention of the proper section as follows:

Attn: Latent Print—all latent print evidence, fingerprint cards for comparison with latents, skin or fingers of deceased persons.

Attn: Questioned Documents—all handwriting, typewriting, printed material, altered or obliterated writing, paper, ink and related evidence.

Attn: Criminalistics Laboratory—all other physical evidence submitted for processing.

E. Express Shipment

1. Commonly Used Methods—United Parcel Service, Greyhound, Air Express and related methods are equally satisfactory.
2. Package Condition—Follow the same procedures listed under “Mail shipment” under D above, making sure that package is sealed completely and a cover letter is placed on the outside of package.
3. Label Address—Since shipments other than mail will not be received in the Bureau post office box, address with full street address (See Appendix B).
4. Mark to attention of proper section—See D-7 above.

F. Evidence Requiring Special Handling

1. Explosives—do not deliver or ship to the laboratory without contacting a *Criminalist* by telephone. Suitable instructions will be given concerning procedures to be followed.
2. Other Dangerous Materials—due to shipping regulation variations, special methods must occasionally be employed. In addition, for the safety of both transporting officers and the Branch staff, it is urged that telephone contact be made prior to delivering loaded weapons, dangerous chemicals, etc.
3. Perishable Materials—deliver only during working hours. If to be shipped, contact ISB first, except in the case of blood and related specimens sent for alcohol, drug or grouping tests.

G. Physical Evidence Bulletins

A number of Physical Evidence Bulletins describing proper procedures for handling, packaging and submitting various types of evidence to the laboratories and special sections are available (see Appendix A for complete list).

These bulletins are distributed by regional laboratories and special sections in the Investigative Services Branch (See Appendix B for addresses and telephone numbers).

PHYSICAL EVIDENCE MANUAL



CALIFORNIA DEPARTMENT OF JUSTICE
 DIVISION OF LAW ENFORCEMENT
 INVESTIGATIVE SERVICES BRANCH

REQUEST FOR
PHYSICAL EVIDENCE EXAMINATION

ISB CASE NO.	
ISB use only	New <input type="checkbox"/> Additional <input type="checkbox"/>
	Resubmittal <input type="checkbox"/>

REQUESTING AGENCY: (Location) COUNTY OF:

OFFENSE: DATE OF OFFENSE: AGENCY NO.:

SUSPECT(S): (Include ID No. if any)

VICTIM(S):

BRIEF SUMMARY OF CIRCUMSTANCES:

EVIDENCE SUBMITTED: (Packages, containers, etc.)

PURPOSE OF EXAMINATION:

CHAIN OF CUSTODY			
EVIDENCE RECEIVED FROM	EVIDENCE DELIVERED TO	DATE	TIME

If further information is needed concerning this case, the following official should be contacted:
 Phone No.:

ISB Report to be sent to the attention of:

Evidence should be returned to the attention of:

Officer investigating this case:

Date results needed by: For (type of court and location)

IS ABOVE LISTED EVIDENCE PROPERLY MARKED AND PACKAGED?
 PLACE THIS FORM IN ENVELOPE ON OUTSIDE OF EVIDENCE PACKAGE

V. EVIDENCE EXAMINATION REPORTS

- A. On completion of ISB analysis, reports are submitted to the head of the law enforcement agency requesting the examinations. These reports are normally marked to the attention of the specific officer submitting the evidence. Copies will be furnished to other agencies only at the request of the submitting agency.
- B. The reports always include the charge, names of subjects involved and agency case number, if known. The date, time and name of the person from whom the exhibits were received and the method of delivery are also included followed by a complete list of all exhibits. The reports include the results of the examinations and the conclusions of the examiner, if appropriate. The method and date of return of the evidence is included at the end of the report.
- C. The person signing the report is the employee responsible for the examinations and who will be able to testify concerning his findings.
- D. All reports are numbered and any future reference to a specific case should refer to the case number in the heading of the report. Attempts are made by ISB to assign the same number to all work conducted on the same crime. Reference to the case number in all future communications permits rapid location of all reports and other information in the Branch pertaining to a specific case.
- E. When analysis results are urgently needed the ISB will furnish preliminary reports by telephone or teletype, if requested to do so.



Photo 3A A member of a Regional Laboratory secretarial staff discussing the typing of a laboratory report.

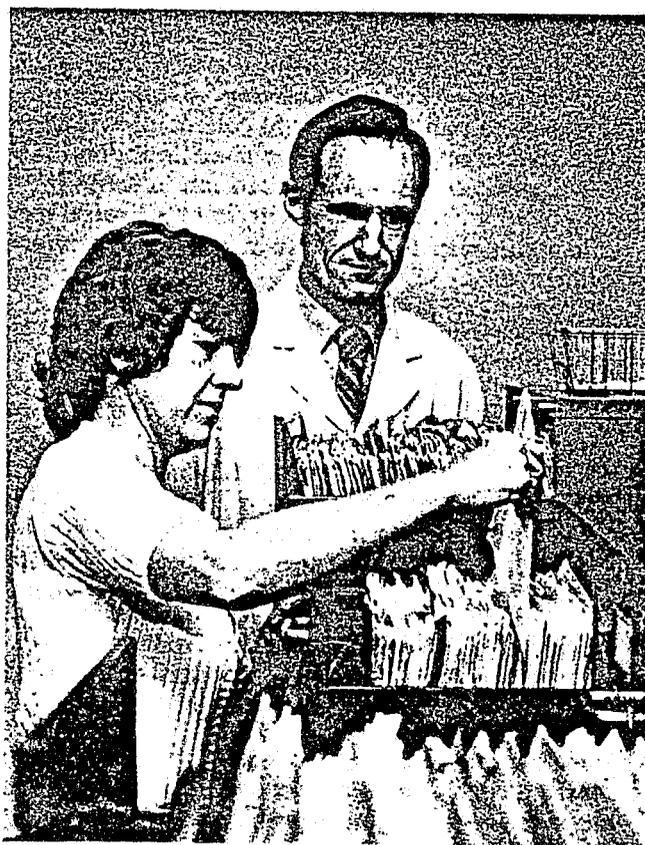


Photo 3B The laboratory files are essential business records for the laboratory staff and the Criminal Justice System.

VI. GENERAL INSTRUCTIONS FOR THE COLLECTION AND PRESERVATION OF EVIDENCE

- A. **Clear Area**—Clear all except essential and authorized persons from the crime scene area. This includes all officers who are not needed for specific functions. The more people present, the more chance there is for damage or loss of evidence.
- B. **Record Scene**—By photographing, measuring and sketching. The location of all evidentiary items must be recorded prior to their movement.
- C. **Use Systematic Approach**—Use caution when searching for evidence. Study the whole scene area first since the relationship of different exhibit positions may be important. Systematically cover crime scene area so that nonobvious or hidden evidence is not overlooked. Speed and carelessness may lead to overlooking evidence or to damage or destruction of important exhibits.
- D. **Limit Number of Evidence Collectors**—Designate one or at most a pair of officers to collect all evidence. This places responsibility on specific individuals. It will also tend to avoid confusion at some later date by identifying the person that recovered specific items and the location in which they were found.
- E. **Photograph Evidence**—Take photographs as necessary prior to moving or securing exhibits.
- F. **Use Common Sense**—Use knowledge, experience and intelligence in collecting evidence. Consider what significance the exhibit may have and what examinations the laboratory may conduct. If this is done, the trained investigator will normally be able to correctly secure and preserve the exhibits.
- G. **Keep Records**—Prepare notes or other records as items are collected. Record the item, its condition (if appropriate), its exact location relative to a fixed and permanent position; the date, time, etc.
- H. **Mark Exhibits**—Place permanent and distinctive marks directly on objects collected if this is possible without damaging the evidence.
- I. **Mark Container**—When unable to mark the exhibit itself, such as in the case of stains, hair, paint, etc., place in a vial or small plastic or other envelope, seal and mark the container. Even when the exhibit itself can be marked it is usually advisable to seal it in some type of container and place additional identification marks on the container.
- J. **Keep Markings Brief**—Initials or the name of the officer collecting is essential. In marking containers other pertinent data can be included, such as date, where found, case number and description of exhibit. Do not include extraneous information or conclusions of the investigator since these might make the label inadmissible as evidence in court.
- K. **Containers**—Various types of containers can be used for items of physical evidence. Several different packaging methods are listed here. The investigator should try to suit his containers to the sample. Due to bacterial or fungal actions it is imperative that you **DO NOT PUT DAMP OR BIOLOGICAL EVIDENCE IN PLASTIC BAGS.**
1. Plastic or cellophane envelopes are suitable for small dry objects.
 2. Paper envelopes—are suitable for folded paper bindles containing very small or powdery material if all corners are sealed. Do not use paper envelopes for fiber evidence, a vial or pill box is preferred.
 3. Vials, pill boxes, capsules and like containers are frequently suitable, depending upon the exhibit and its condition.
 4. Garments and large exhibits can be placed in bags or rolled in paper.
 5. Paper or plastic envelopes can be sealed around the ends of large exhibits, such as tools, with plastic tape to prevent loss of adhering evidence.
 6. Loss of adhering evidence on large exhibits, such as safes, vehicle bumpers, etc., can be prevented by placing plastic or paper over the evidence and sealing it down with tape.
 7. Always use clean and new containers to prevent contamination.
 8. Special precautions regarding containers employed for specific types of evidence are discussed in the various other sections of the Manual.
- L. **Sealing Containers**—Preventing loss, contamination, or access by unauthorized persons are of primary importance. Also, do not overseal and complicate opening the container in the laboratory. Avoid or limit the use of staples and never apply to plastic containers if fine particles of material are enclosed since staples rip small holes in plastic.
- M. **Keep Exhibits Separate**—Each different item or similar items secured at different locations should be placed in separate containers. Packaging sepa-

PHYSICAL EVIDENCE MANUAL

rately prevents damage through contact and cross contamination.

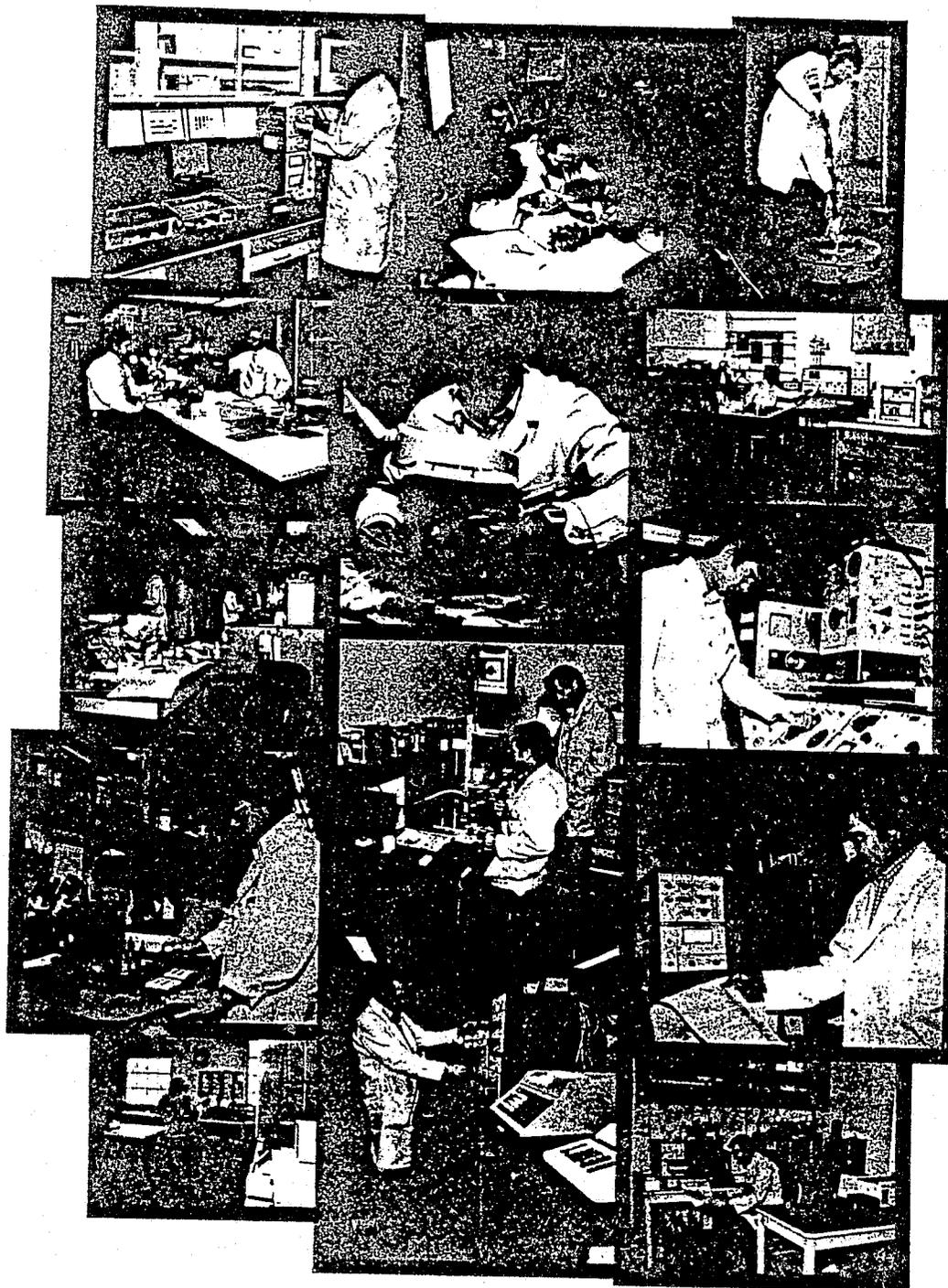
N. Storing Evidence—Always store in a safe, evidence vault, locker or some other location where others do not have access to it. This includes both temporary and long term storage.

O. Keep Chain of Possession Short—Each person having

an exhibit in his possession, even if in a sealed container, may be required to testify as to such possession. To save the time of law enforcement personnel as well as the courts and to avoid confusion, keep the chain of possession as short as possible. In any case, each person having the exhibit in his possession should mark it or mark the container, if the exhibit is sealed in one.

VII. PHYSICAL EVIDENCE STUDIES CONDUCTED BY THE CRIMINALISTICS LABORATORY

The following sections furnish instructions, as well as general information, relative to specific types of physical evidence. It is not possible to include every conceivable type of evidence in a manual of this type, but a majority of frequently encountered types is included.



A. BLOOD STAINS

Studies of blood stains are frequently of importance in a wide variety of criminal investigations. In some cases, particularly homicide, crime scene examinations by a Criminalist may be required to establish direction of origin of blood splatters, show movements of individuals, establish sequence of deposit of stains and to develop other necessary information. The more common type of blood studies are laboratory operations involving analyses of recovered stains.

1. Fresh Moist Stains

- a. Do not heat stained material or place it in bright sunlight to dry. Hang clothing and similar articles in a room where there is rapid air movement, such as in front of a fan. Caution, a fan should not be used if foreign material has potential significance.
- b. If not *completely dried* before packaging, decomposition will occur which will prevent complete testing.
- c. When the stain is dry, label the item and roll it in paper or place it in a paper bag or box; seal and label container. **DO NOT PUT STAINED OBJECTS INTO PLASTIC BAGS.**

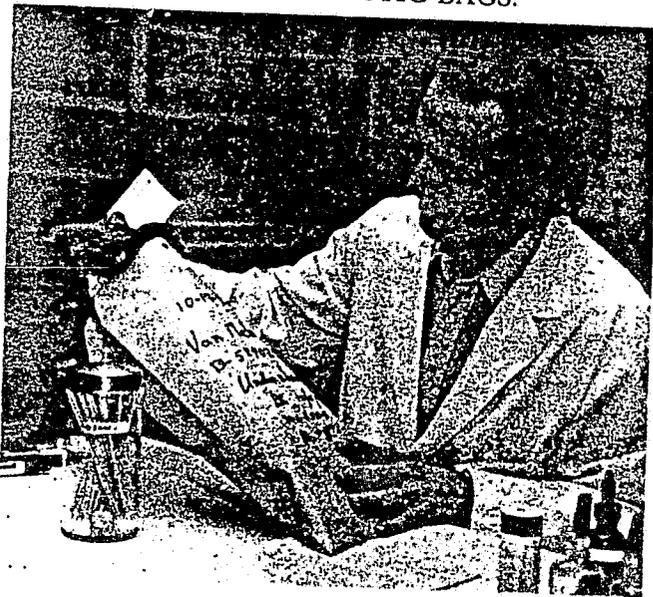


Photo 5 Air dried bloody clothing being wrapped for mailing.

2. Dried Stains

- a. On Cloth—Label article, roll in paper or place in a bag or box, seal and label container. Do not attempt to remove stain from the cloth.
- b. On Small Solid Objects—Send entire stained object to laboratory, after labeling and packaging.
- c. On Large Solid Objects—If practical to deliver whole object to the laboratory, any areas con-

taining dry stains may be covered with paper and the edges sealed down with tape to prevent loss or contamination. If impractical to deliver the whole object to the laboratory, scrape stain onto a clean piece of paper which can be folded into a bundle and placed in an envelope. Scrape blood from object using a freshly washed and dried knife or similar instrument. Wash and dry instrument before each stain is scraped off so as not to cross contaminate samples with traces of blood on the instrument used. Seal and mark container.

- d. Do not mix separate dried stains. Place each stain in a separate container.
- e. If the stain cannot be removed in any other manner, use a piece of gauze dampened with distilled water to absorb the stain. Make a similar swab of an unstained area. Dry the gauze pads; place in separate envelopes; mark and seal.

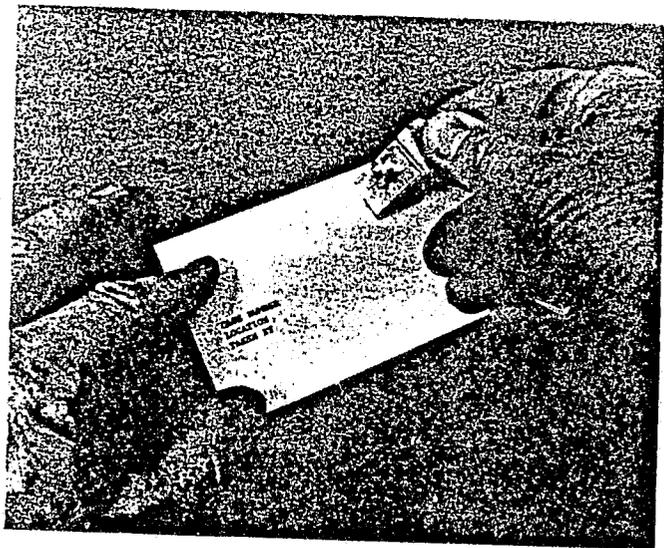


Photo 6 Band-aid pickup of blood. A method of conveniently collecting and forwarding blood from a crime scene.

3. Comparison Specimens

- a. If grouping of stains is desired, always obtain fresh known samples of all subjects involved. Grouping of dried stains seldom has any significance unless the blood groups of the subjects involved in the case are known. Information concerning the blood groups of subjects involved in an investigation may also assist the laboratory in selecting the most suitable test method or methods.
- b. It is usually possible to obtain known blood specimens from defendants if requested soon after the arrest. Often the subject will consent to the withdrawal of a specimen if he is advised

that the results may prove that the stains in question are *not* his blood and that in any event it is *not possible to prove* that such stains are his blood.

- c. Submit fresh blood samples from subjects in two separate vials. One sample should be in a sterile vial containing a preservative and an anti-coagulant (gray stopper tube). The other sample should be in a sterile vial without added preservatives (blue, green, or purple stoppered). Label each vial with the name of the subject, date, name of person withdrawing specimen and officer's name or initials. Submit such specimens to the laboratory as soon as possible.
4. Types of Tests Conducted
- a. Proof of presence of blood.
 - b. Detection of human origin of blood.
 - c. Detection of some types of animal bloods. Suitable *sera* are maintained in the laboratory for the detection of blood of common animals. If appropriate serum is not on hand, however, some delay will occasionally occur before special tests can be made.
 - d. Determination of basic ABO blood groups.
 - e. The laboratory is able to type some factors present in dried blood. Some of these factors deteriorate in two weeks. Others retain activity for several months. In cases where the basic blood groups cannot distinguish between individuals, other factors present in the specimens will be examined.
 - f. It is not presently possible to prove that a bloodstain came from a specific individual. It may be possible, however, to demonstrate that all blood groups present in the stain and in the blood of a subject are alike. When this is the case it must be realized that many other persons will also have blood of these same groups. In other cases it may be possible to demonstrate that a stain could not have come from a specific person.
 - g. The laboratory will conduct blood grouping whenever necessary for the investigation or prosecution of a criminal case. Such tests, however, are frequently complex, tedious and time consuming and should therefore be requested only when it appears that the results may have significance. A common example of requests for unnecessary examinations involves bloodstains on the victim's clothing. A fresh sample of blood from the victim is usually a better sample. The clothing may, of course, be submitted for stab or bullet hole examinations or other studies but performing blood grouping on evidence of this nature should not be expected.

- h. Some blood group factors have been found only in certain racial groups. Occasionally one of these factors will occur among the blood groups of an individual involved in a specific crime. If such a blood group factor is found in a stain left at a crime scene by the perpetrator, information concerning his race may be of material value to the investigator in apprehending the suspect. For these reasons, the laboratory should be informed of the race of all individuals known to be involved in crimes when bloodstain evidence is present.
- i. Transfusions of persons seriously injured will alter their blood chemistry and obscure their true blood groups. In these cases it is necessary to wait at least 60 days after the transfusion to obtain a valid blood sample.

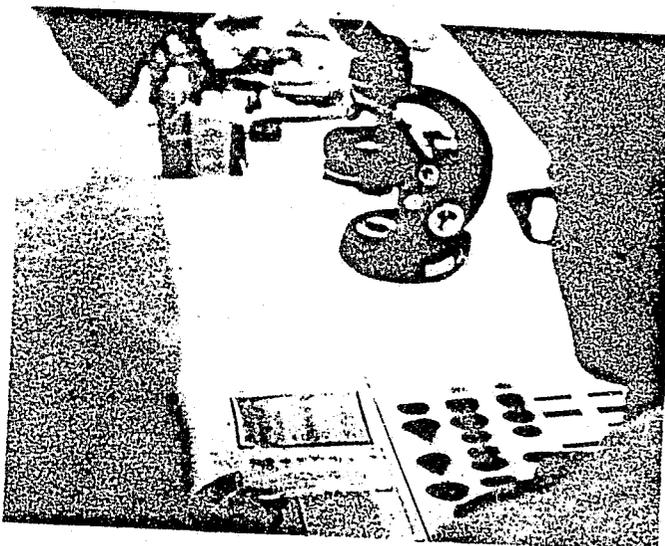


Photo 7A Genetically related enzyme variants in dried blood can now be examined in the California Department of Justice's Criminalistics Laboratories. The illustration shows starch gel and photographic representation of an enzyme system.



Photo 7B Necessary treatment of an enzyme starch gel electrophoresis to visualize the genetic variants.

B. SEMINAL STAINS

Semen is the male reproductive fluid. It normally contains spermatozoa, which are reproductive cells, as well as other substances. It is possible to identify dried semen by either chemical tests or the microscopic identification of characteristically shaped spermatozoa.

1. Seminal stains are often, but not always, found on clothing, blankets, sheets or other materials in rape and other sex offenses. When dry they may have a stiff, starchy feel and can often be located by the sense of touch.
2. In sex offense cases the victim should always be examined by a physician and a vaginal specimen taken. The laboratory can examine such specimens for sperm cells. Vaginal specimens can be submitted either as smears, swabs, or aspirates, although the collection of a vaginal aspirate in a clean glass vial is the preferred method. Time is of the essence in obtaining vaginal specimens as bacterial action rapidly destroys the sperm cells. The victim should be examined as soon as possible after the incident and the vaginal specimen kept refrigerated until delivery to the laboratory.
3. Submit all suspected stained materials to the laboratory. If possible, always include the panties, other underwear and clothing from the victim. All garments should be placed in separate packages. The packages containing the victim's clothing should be kept separate from those containing the suspect's clothing.
4. Label all garments or other exhibits.
5. If damp, always allow fabric to air dry completely before packaging to prevent decomposition. When stain is dry, roll garments gently in paper, place in paper bags and then seal and label container. Do *not* put such stained objects into plastic bags.
6. Handle fabrics as little as possible.
7. Under special circumstances seminal stains may be analyzed for the ABO or other blood group factors. If this type of testing is requested, contact the laboratory by telephone prior to shipping exhibits. This is essential since other biological samples are required (blood and saliva from victim and suspect).

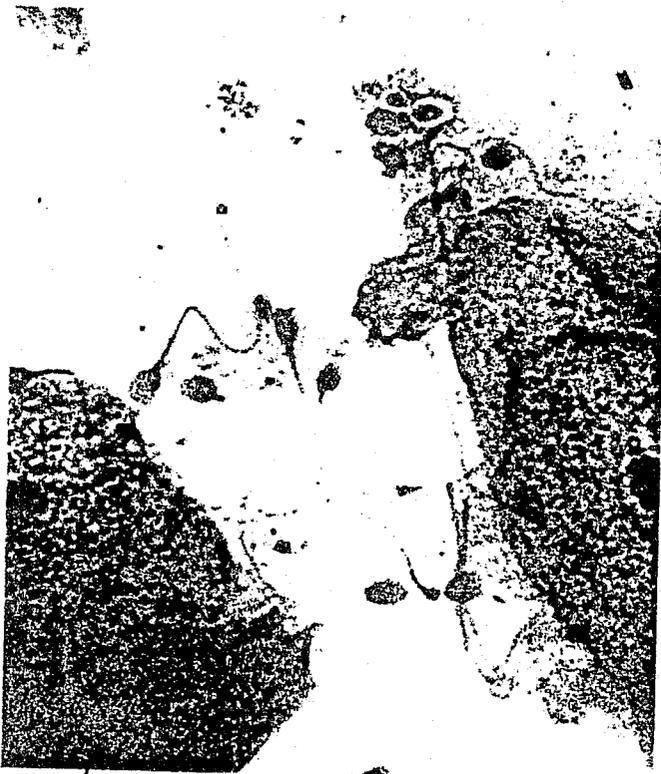


Photo 8A Human spermatozoa from garment of victim in rape case.



Photo 8B Visualizing seminal stains from clothing.

C. FIBERS AND THREADS

Clothing, rugs, blankets, curtains and other fabrics are such common articles in modern society that their value as evidence may be overlooked. Although very common, a tremendous variety of animal, vegetable and synthetic fibers of numerous colors are used. Thus threads and individual fibers will frequently serve as useful evidence in criminal cases.

1. Fibers and threads will often be found in fabric abrasions, torn metal or in other areas on hit and run vehicles. In burglary cases such evidence may be located on a torn screen, broken glass, or metal on safes or other locations. Fibers may also be important in incidents of personal contact such as homicide, assault and rape cases where cross transfers may occur between the clothing of suspects and victims.
2. Examinations of fibers will usually establish their type and color. Such studies may also indicate the type of garments or fabric from which the recovered fibers or threads originated.
3. Fibers and threads can also be compared with clothing of subjects to determine whether or not they could have originated from such garments.

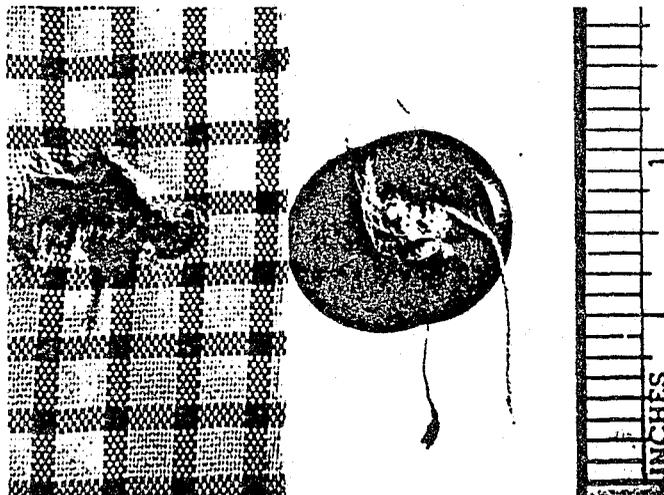


Photo 9 Shirt of murder suspect from which button was forcibly pulled out and a button found in hand of victim. This button matched others on the shirt and fibers adhering to the button threads matched the shirt fibers.

4. Complete threads or long fibers can frequently be picked up with the fingers or tweezers. When recovered they should be placed in plastic envelopes or glass or plastic vials. Never place loose fibers directly into mailing envelopes or other paper containers since they are difficult to locate and remove in the laboratory and the paper itself may contain fibers.
5. If the fibers are short, few in number or firmly adhering to an exhibit, attempt to remove the complete item containing the fibers and place it

in a plastic envelope. All fibers present may more readily be located and removed from such exhibits in the laboratory.

6. *Never* attempt to pick up fibers on gummed tape unless no other method for recovery of the evidence is available. Once firmly caught in the gum on the tape it is almost impossible to remove them for study and the adhesive may interfere with laboratory tests.
7. Whenever fiber or thread evidence is recovered, submit to the laboratory for comparison purposes *all* clothing of persons from whom the evidence might have originated.
8. In sex offenses, assaults and some other investigations it may be possible to indicate or demonstrate contact between two individuals or between one individual and some other object by comparing transferred fibers. Such examinations are only of value when it is known that *no contact occurred* between the individuals or objects prior to or subsequent to the offense. Extreme care must be taken to keep all articles of clothing and other objects separated. *Each garment should be separately packaged in paper bags.* If large, garments may be laid on *clean* sheets of paper on a table and separately rolled up in the paper. Always mark each exhibit. If the clothing of either subject touches the clothing of the other or is even laid down on a table or placed on a car seat previously contacted by the clothing of the other subject, the comparisons may have no value.



Photo 10A Criminalists removing fibers alleged to be from the victim's clothing, found embedded in the windshield of the suspect hit-and-run vehicle.



Photo 10B Criminalists removing fibers alleged to be from the victim's clothing, found embedded in the windshield of the suspect hit-and-run vehicle.

9. Fabric impressions which may contain embedded fibers are frequently found in hit-run cases. If the area containing the impression cannot be conveniently submitted to the laboratory, a photograph should be taken of the area. Always mount the camera on a tripod so that the film is parallel with the impression. Include a ruler next to the impression photographed so that the size of the mark can be determined. In such cases submit all outer clothing of all victims for the comparison purposes. When the object containing the fabric impression cannot be removed but is rather photographed, a search should also be made for fibers. Any fibers located should be removed and placed in a vial or coin envelope if possible. In the event that the fibers are difficult to recover and if they are embedded in paint, scrape the paint and fibers into a coin envelope and seal the corners with tape. Usually the fibers can be separated from the paint in the laboratory.

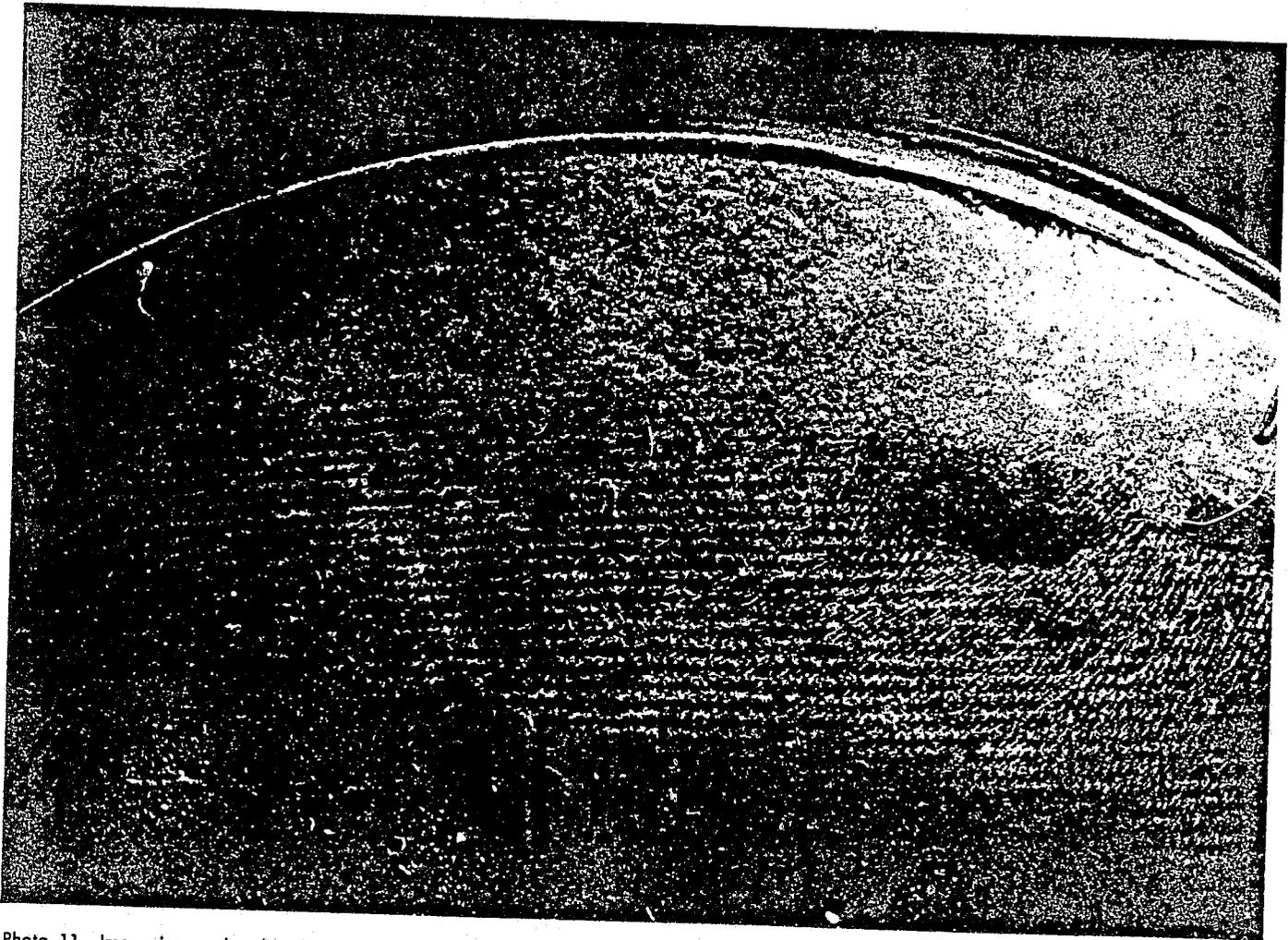


Photo 11 Impression produced in dust on headlight of hit-run car by the coat of the victim.

D. HAIR

Although hair is a frequently encountered type of evidence it has real evidentiary value in only a limited number of cases. Except for determinations as to possible source, such studies also require fairly large samples if the laboratory results are to be of real significance.

1. Human Hair

- a. Hair samples can be identified as human and some indication of the part of the body from which they originated can frequently be established.
- b. Hair color can be determined and some information developed concerning bleaching, dyeing or related treatment.

- c. The racial traits of the individual from whom head hairs originated can be suggested in some instances.
- d. Study of hairs can frequently establish whether or not they fell out naturally, or were pulled out or if they have been cut or crushed.
- e. It is presently not possible to conclusively prove that two specimens of hair came from the same individual. In the case of head hair, however, the laboratory may be able to indicate a possible common origin. The value of such studies will vary greatly depending upon the quantity of hair recovered as well as the characteristics found in the examination.

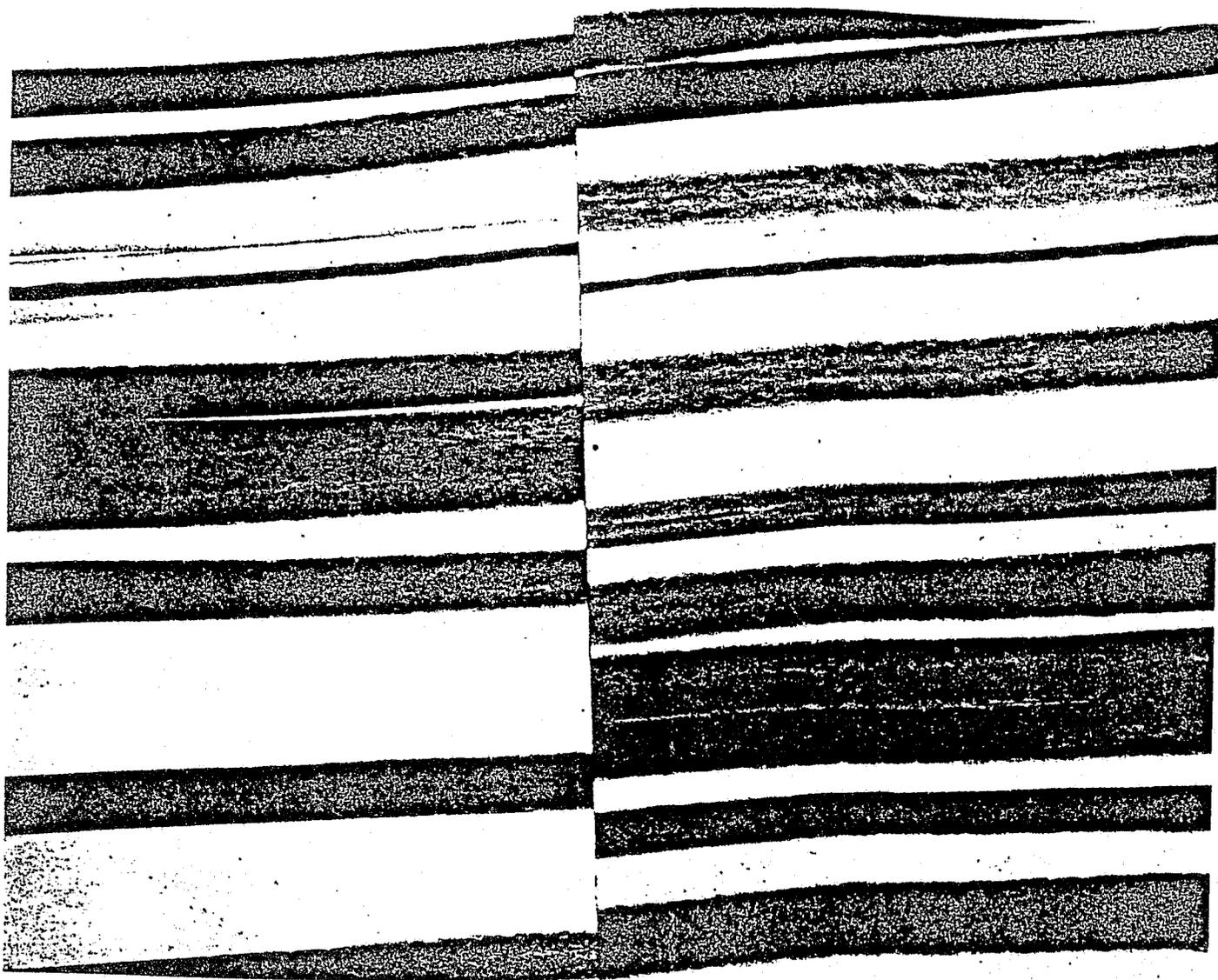


Photo 12 Even though there are similarities in hairs from the same person, there are also considerable variations as illustrated. Thus it is extremely difficult to state that hair is from a specific person.

2. Animal Hair

- a. Animal hair samples can sometimes be identified as to the genus of animal from which they originated.
- b. While animal hair can be compared with specimens from specific animals, this type of examination will only serve to establish similarities in structure and animal type. It is never possible to prove that recovered animal hairs came from a specific animal.

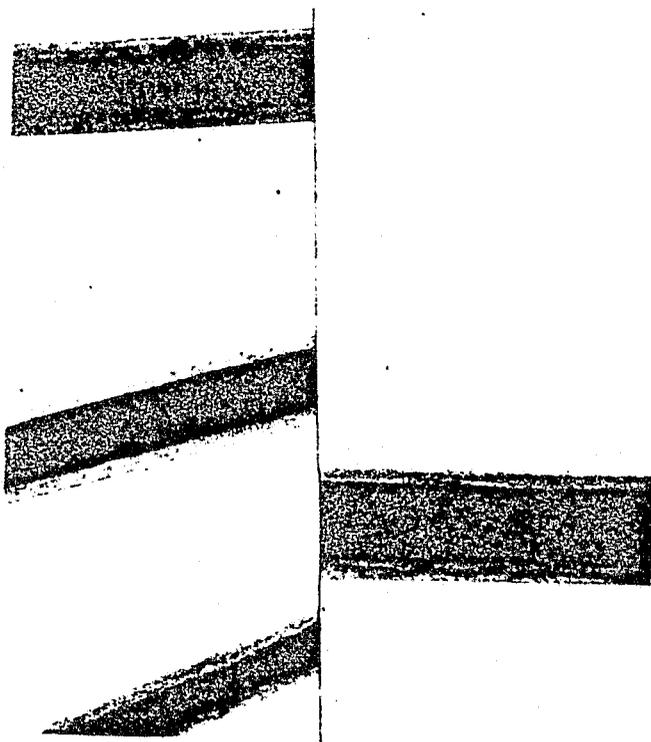


Photo 13 Comparison of hair from horse struck by hit-run vehicle (left) and hair removed from suspect vehicle (right). Horse was being ridden by young girl who was also injured.

3. Recovery of Hair Evidence

- a. If hair is firmly attached, such as in dry blood or caught in metal or a crack in glass, do not attempt to remove it, but rather leave the hair intact on the object. If the object is small, mark and seal it in an envelope with sealed corners. If the object is large, cover the area containing the hair with a protective layer of paper to prevent loss of the hairs during shipment.
- b. Recover *all* hair present. If possible, use the

fingers to pick up the hair and place in a vial or paper envelope with sealed corners. Do not mix samples recovered at different locations. Label and seal the container. Never use gummed tape to pick up hairs and do not wash or clean them.

4. Standards for Comparison

- a. If injuries to a victim suggest a point of origin, secure hair specimens from as near this location as possible.
- b. When the point of origin is unknown, secure samples from various locations and keep samples separate. In the case of human head hair it is important to obtain samples from different areas on the head since variations in structure or color of head hair frequently occur on the same individual. Likewise, there is a major difference in human head, pubic, arm, beard and other hair from different parts of the body. Animal hair secured from different areas on the animal body will also vary greatly in structure.
- c. Whenever possible obtain large samples from each area. It is desirable that each of these contain at least several dozen hairs.
- d. Attempt to pull out standard samples which will be used for comparison purposes. If this is not possible, cut the hair as close to the skin as possible. Note whether the hair was cut or pulled.
- e. Always obtain samples from all individuals involved. In many investigations the laboratory is requested to determine if a sample in question originated from a specific individual when there are only a limited number of persons from whom the hair could have come. In the case of hair samples from vehicles in accidents, beds in sex offense cases and similar investigations, it is important to have standard samples from all possible occupants and not just from the individual from whom the hairs are believed to have originated.

E. PAINT

Paint is one of the most common types of physical evidence encountered. Paint evidence will be found in the majority of hit-run and burglary cases where it may prove to have material value. Paint evidence may also be involved in various other types of crimes.

1. Hit-Run Cases

- a. Paint may be transferred to the clothing of pedestrian victims. Examine all garments with particular attention being paid to areas showing pressure glaze, tears, or other contact.
- b. If found, do not remove the paint, but mark the garment and dry it completely if damp. Then carefully wrap each item separately by rolling in paper or place each garment in a separate paper bag for delivery to the laboratory.
- c. Such paint will at least show the color of part of the responsible car. It must be remembered, however, that many modern cars have more than one color and the paint transferred only represents the color of the particular *area* on the car that made contact with the victim.
- d. It is sometimes possible to indicate the manufacturer and year of vehicle from a paint transfer. Such findings may assist officers in the apprehension of the responsible vehicle. When this type of study is desired it is of considerable assistance to the laboratory to receive any information available concerning the responsible vehicle. This includes receipt of any other evidence found at the scene, such as broken plastic lenses or other vehicle parts, which may in themselves indicate the make and year of the vehicle. Statements made by witnesses which suggest one or more possible types of vehicle are also of interest and should be included in any request letter forwarded with the evidence.
- e. Sometimes whole chips of paint will be transferred to the clothing. If these flakes contain several layers and particularly if they came from a repainted car, such evidence may have great value when the responsible car is located.
- f. Chips of paint may also be found on the ground near the point of impact. In some cases it has been possible to physically match several chips found at accident scenes with paint remaining on the fender of the suspect's vehicle.
- g. Obtain samples for comparison from *all areas showing fresh damage* on suspect vehicles. This is very important since the paint may be different in type or composition in different locations even though the color is the same. If the paint can be flaked off by bending the metal slightly, remove it in this manner. If not, scrape

paint off using a clean knife blade. In every case make certain that samples of *all layers* down to the metal are collected. Carefully wipe the blade of any knife or scraping tool employed before collecting each sample to prevent cross contamination. Place each sample collected from different areas in separate containers.

- h. Cross transfers of paint commonly occur in hit-run cases involving two or more vehicles. If loose paint chips are located in such cases, attempt to remove and place them in coin envelopes. If, however, the transfers are smeared on the surface, flake off chips or scrape paint from vehicle including the transferred paint as well as the top layer of paint originally on the car. Keep all transfers recovered from different areas in separate containers.
- i. When cross transfers occur, *always collect known, uncontaminated samples from each vehicle from areas immediately adjacent to each transfer collected*. This is of great importance since such specimens permit the laboratory to distinguish between the transferred paint and the paint originally present on the vehicle.

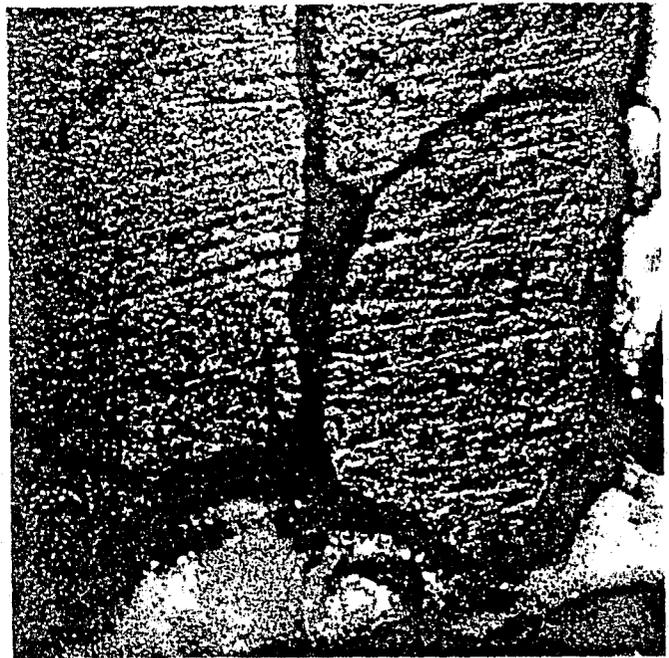


Photo 14 Paint from safe which was hauled away from burglarized store (left) and chips of paint found in vehicle of suspect (right). Corresponding abrasion markings on paint surface established that all came from the same source.

2. Burglary Cases

- a. Tools used to gain entry into buildings or safes often contain traces of paint as well as other substances such as plaster, safe insulation, etc. Care must be taken that this type of trace evidence is not lost. If such transfers may be present, wrap the end of the tool containing the material in a plastic envelope and seal with plastic tape to prevent loss. *In no case* should attempts be made to fit the tool into marks or impressions found. If this is done, transfers of paint or other material might occur and any material later found will have no significance as evidence.
- b. Collect specimens of paint from all areas which the tool may have contacted at the crime scene. These samples should include all layers present.
- c. The tool itself may contain paint or other coatings, traces of which may be left at the crime scene. Careful search should be made of each tool mark for any such evidence.

3. Recovery and Preservation of Paint Specimens

- a. Keep all samples collected in separate containers.
- b. If the sample is very small or difficult to remove and the complete exhibit itself can be sent to the laboratory, this is the best procedure and will make available all of the paint without loss.
- c. Always scrape or otherwise remove samples of all layers of paint or other material present if the complete exhibit containing the paint is not to be submitted to the laboratory.
- d. Small glass or plastic vials are excellent containers for paint.

- e. Paint may also be placed on sheets of white paper which can then be folded and sealed to prevent loss.
- f. Paper envelopes should never be employed for the submission of paint unless the specimen is very large in size. If such envelopes are used, always seal all four corners with plastic tape to prevent loss and follow the procedure as outlined in section e.
- g. A very useful method for securing paint from vehicles, walls and similar locations is to place a short strip of plastic tape on one side of the open end of a small paper envelope with the gummed flap folded back. The tape and envelope are then attached to the object containing the specimen. By holding the envelope open with one hand paint can be scraped loose and into the envelope with a clean knife blade. Once the sample is in the envelope the tape can be removed, the flap folded forward and the open end of the envelope folded several times. Then this folded area is sealed with a paper clip or a short length of tape. Such a container may then be sealed in a standard mailing envelope which may easily be marked for identification.
- h. Markings placed on labels, envelopes or other containers should include the officer's name, date and time of collection, as well as the specific source of the sample (for example: R/F fender 1970 Ford, license #ABC 123).
- i. In no case should conclusions of the officer, requests for examination or other unnecessary writing be included.



Photo 15 Chips containing three colors of paint from trunk of suspect's car (left) and from safe which was hauled away in a burglary (right).



Photo 16 A method for securing paint samples from vehicles and similar locations. Attach plastic tape to one side of open end of envelope and seal below area to be scraped.

F. GLASS

Windows are frequently broken in burglaries, headlights in hit-run cases and bottles or other objects may break with fragments being left on garments or other property of subjects involved in various types of crimes.

1. Collection and Packaging of Evidence Glass

- a. The shoes and clothing of suspects as well as other objects which may be contaminated with glass should be marked and wrapped separately to avoid cross-contamination. Even though contaminating glass is not usually immediately visible to the investigator, any visible pieces should not be removed or disturbed, but rather the entire article should be carefully wrapped to protect and preserve the contaminant as found on the article.
- b. *All* glass found at hit-run scenes should be recovered. All glass should be collected because more than one type may be present. In addition, if just a few representative samples are saved, individual pieces that could be physically matched with glass remaining in the headlight shell of the suspected vehicle may be overlooked. The search should not be limited to just the point of impact since other headlight glass may drop off at some distance away as the car leaves the crime scene. Glass from different locations should be kept in separate containers.
- c. Place small glass fragments in envelopes or pill boxes. Completely seal and mark the container.
- d. Place large glass fragments in bags or boxes but separate individual pieces with newspaper or tissue to prevent breakage and damage to

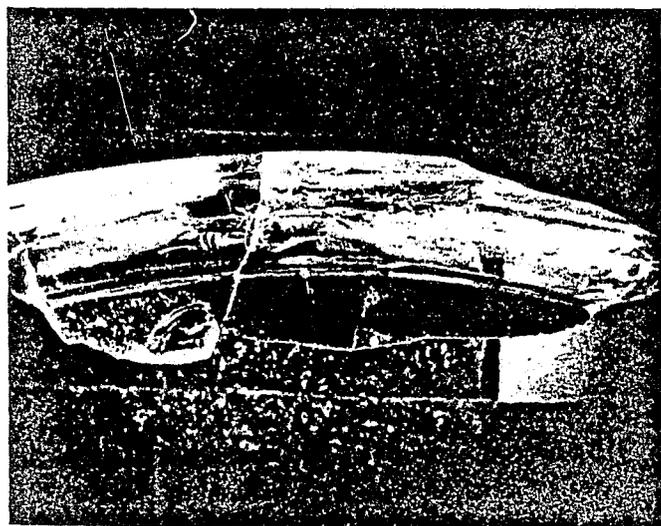


Photo 17 Comparison of headlight lens glass fragments from a hit-run scene and a suspect vehicle.

edges during shipment. Large fragments can be marked with grease pencil, adhesive tape, labels or a scribe, but this is usually not necessary if all are sealed together in a single marked container. When breakage direction determinations will be needed, it will be necessary to mark each glass piece prior to its removal from the window to designate inside and outside surfaces.

- e. The headlight filaments from the broken headlight of a suspect's car may bear significant glass contamination. The absence or presence of fused glass can be determined in the laboratory and may provide evidence as to whether the headlights were illuminated at the time of headlight breakage.

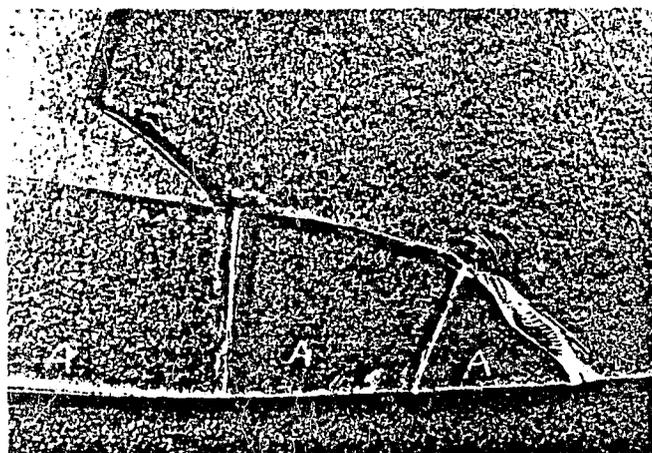


Photo 18 Three pieces of glass found in a suspect's vehicle (marked A) matched with larger pieces from broken window at a burglary scene.

2. Standards for Comparison

- a. Windows—If a broken window at a crime scene is small, submit the whole window or all glass remaining to the laboratory. If the evidence glass is large enough for physical matching of broken edges or comparing the fracture lines, hackle marks, surface abrasions, or contamination, the whole broken window is necessary. When physical matching does not appear possible and a broken window is large, the recovery of *several* samples from different areas on the window is usually satisfactory. Heat-hardened or tempered glass is commonly encountered in glass doors and automobile side and rear windows. The well-known diced breakage of this kind of glass into typically small, rectangular beads makes physical matching impractical in most cases. Several pieces should be collected

PHYSICAL EVIDENCE MANUAL

for comparison of physical properties with evidence glass.

- b. Auto Headlights—*All glass remaining* in the shell must be recovered if physical matching with fragments from the scene is to be conducted. Remember to consider the potential value of glass on the lamp element as an indicator of whether the headlight was on at the time of breakage. These will be microscopic fragments, not normally visible to the unaided eye.
- c. Other Glass—When bottles or other glass objects are broken, recover *all* glass remaining. Glass on shoes of suspects can be compared with broken bottles at crime scenes and glass from the skull of a murder victim can be compared with a broken bottle used as a weapon.

3. Value of Glass Comparison

Glass will have greatest value as evidence only when fragments from two sources can be physically matched together. When this is possible, a common origin can be conclusively established even when the fragments are quite small. In the case of powdered glass and minute fragments, it can be established that the material is, in fact, glass and

very accurate comparisons can be conducted. However, conclusive identifications as to common origin are usually not possible. Nevertheless, the latter type of comparisons will establish similarities or differences in samples and thus may prove significant.

4. Other Glass Studies

Other studies of glass are periodically of importance. In the case of broken windows or other glass sheets, it is often possible to determine the side to which the force was applied which resulted in breakage. When multiple fractures are present in glass it also may be possible to determine the order in which the breaks occurred. It is also possible, in some instances, to prove the sequence of shots through glass when consecutive bullets penetrate glass from one or both sides. In all such instances it is essential to have available for study *all* glass remaining in a window as well as *all* fragments which break and fall to the ground. A simple diagram should be made to differentiate and identify the origin of glass samples from the window and from the ground. A copy of this diagram should be submitted with the evidence.

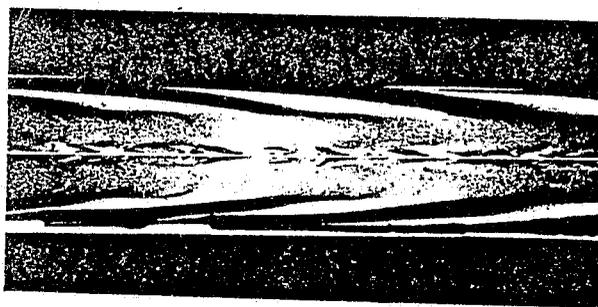


Photo 19A Hackle marks on fractured edges of window glass.

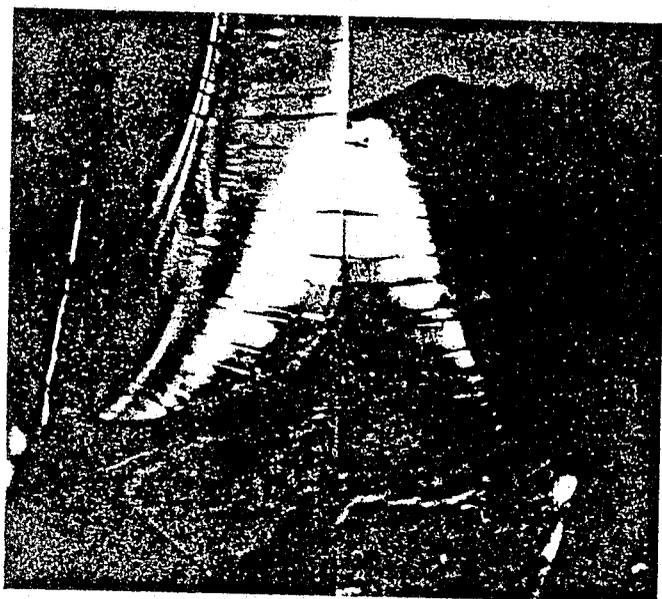


Photo 19B Comparison of hackle marks on fractured edges of small glass fragments from hit-run vehicle and accident scene.



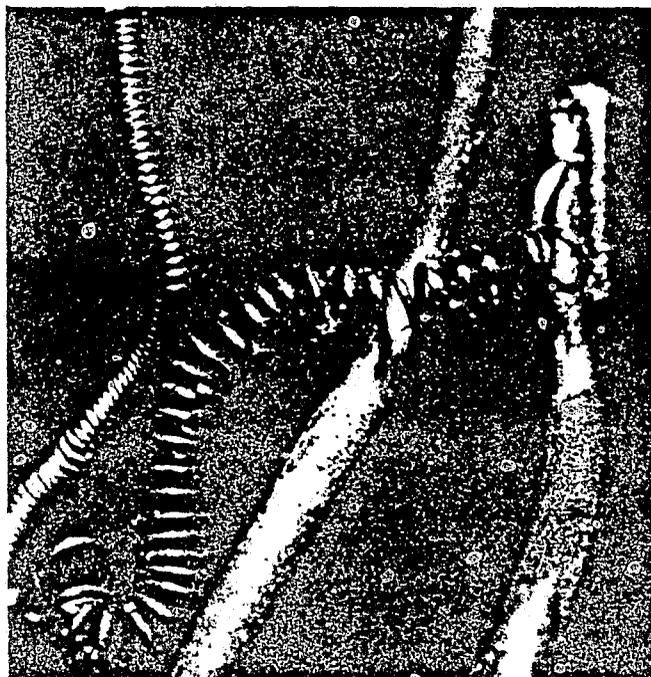
Photo 19C Rib marks on fractured edges of two small glass fragments from hit-run vehicle and accident scene.

G. OPERATING CONDITION OF LIGHTS

As part of the investigation of vehicle accidents it is often of importance to determine whether or not a headlight, taillight, spot light, turn indicator light or other unit was illuminated at the time of the accident. Such determinations can usually be made if the lamp bulb has been cracked or broken at the time of the accident. In some instances such determinations can also be made even if the glass is not broken.

1. Recovery of ALL parts of the broken lamp is of primary importance. Carefully remove the COMPLETE lamp unit if possible. Otherwise remove ALL PARTS of the unit even if it is completely smashed. The parts recovered should include the socket, glass fragments, filament supports and the filaments. A thorough search for any portions of the coiled filaments themselves is of great importance since they are very small and fragile and may be overlooked when broken. The recovery of the filaments is of greatest value since more information can be secured from them than from examination of any other parts of the lamp unit or light bulb.
2. Separated filaments recovered should be protected from further breakage. They may be placed on cotton and sealed in a box or vial or inserted into a plastic envelope reinforced by a piece of cardboard. Always prevent any further breakage.
3. Broken lamp units and parts which have been recovered should be marked and then packaged in a manner to prevent further damage during shipment.
4. Whenever practical, if the broken unit is one of a pair, attempt to remove and submit to the laboratory the other lamp of the pair. Frequently, such unbroken units will aid in determining the age and condition of both lights prior to the time that one was broken.
5. Check the vehicle at the time the lamps are removed to determine the purpose served by each broken light. While this is normally obvious, occasions do arise in which wiring has been altered. This is particularly true in the case of some motorcycles where occasionally it has been found that tail and stop light wires have been reversed.
6. In the investigation of accidents where the operating condition of lights is of importance, always check the position of the light switches. Also question all suspects, victims and witnesses as to their observations concerning the operation condition of lights involved.
7. Advise the Laboratory if any attempt has been or may have been made to turn on a damaged or broken lamp after the accident occurred.

Photo 20 Tail and brake light filaments from broken unit on rear of vehicle involved in accident. Small taillight filament (left) was off. Large brake light filament (center) was on. This is shown by the small glass beads which are fused to the brake light filament.



H. PLASTIC

Different types of plastics are used in a wide variety of modern products. Periodically such articles will be broken or otherwise become involved as evidence in various criminal investigations.

1. Parking, turn indicator, guide and tail light lenses on most motor vehicles are now made of plastic. When these are broken at accident, burglary or other scenes the fragments recovered will frequently serve to indicate a specific make, model or year of vehicle. This is generally possible because different sizes, shapes, designs and color of such lenses are used by the various manufacturers on different year or models of vehicles.
2. When fragments of lens plastic of adequate size are recovered, attempts should be made to have them identified by local auto dismantlers or new vehicle parts department personnel. When such plastic cannot be identified locally, it may be forwarded to the laboratory for additional study.
3. When a suspect vehicle is apprehended, which contains broken plastic, remove all portions of the unit remaining. If physical matching of broken edges on fragments from the two sources is possible, a common origin will be conclusively established. In those cases where physical matching of

fragments is not possible (usually due to loss of intervening fragments) analysis to determine the specific type of plastic can be carried out. The latter, however, usually have somewhat limited value since different manufacturers will commonly use the same type of plastic on many different lenses.

4. Various types and widths of plastic tape may be used to bind robbery victims, insulate electrical wire connections, or be employed for other purposes. When such plastic tape is recovered as evidence, it can be readily compared with either rolls or strips of tape in the possession of the suspect. In some cases it has also been possible to physically match together cut or torn ends on tape from two sources.
5. Subjects who commit various types of crimes where they are apt to remain at the scene for an extended period will occasionally open cigarette packages and leave parts of torn plastic, foil or labels at the scene or in a vehicle. When such individuals are apprehended within a short period of time and still have the cigarette package in their possession, it is possible to physically fit together the torn wrapper portions from the two sources. Such findings will establish that the subject was at the crime scene.

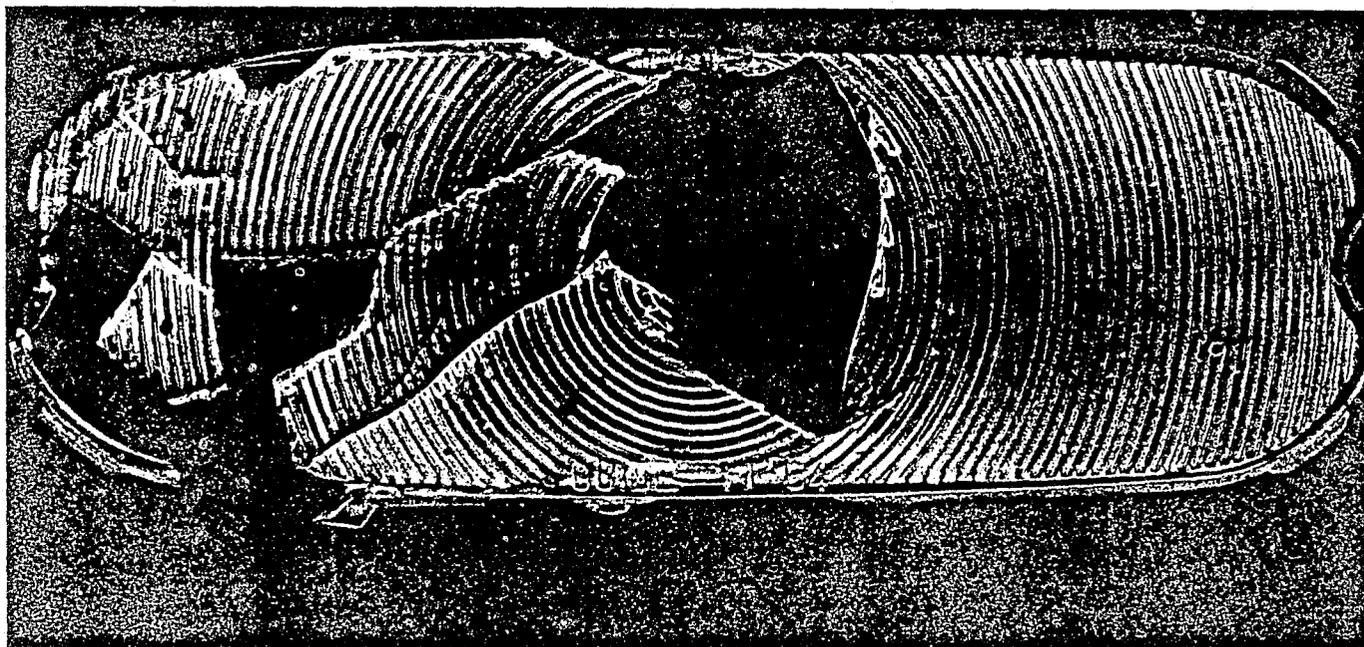


Photo 21A Physical comparison of plastic recovered at fatal hit-run scene (marked with black dots) and broken turn indicator lens on suspect car. Prior to apprehension of car the pieces from the scene indicated make and year of vehicle involved.

PHYSICAL EVIDENCE MANUAL

6. Many other plastic studies have proven to be of significance in various investigations. Additional examples of the use of such evidence are the following:

a. A minute deposit of plastic in a scratch mark on the side of an automobile was proven to correspond with a plastic grip on the handlebar of a hit-run victim's motorcycle.

b. A plastic purse of another accident victim was found to correspond with a trace smear of black plastic on an automobile fender.

c. Plastic from a bomb which exploded after being shipped by mail was identified as corresponding with wire insulation on electric blasting caps made by a specific manufacturer. The suspect in this case had such blasting caps in his possession.

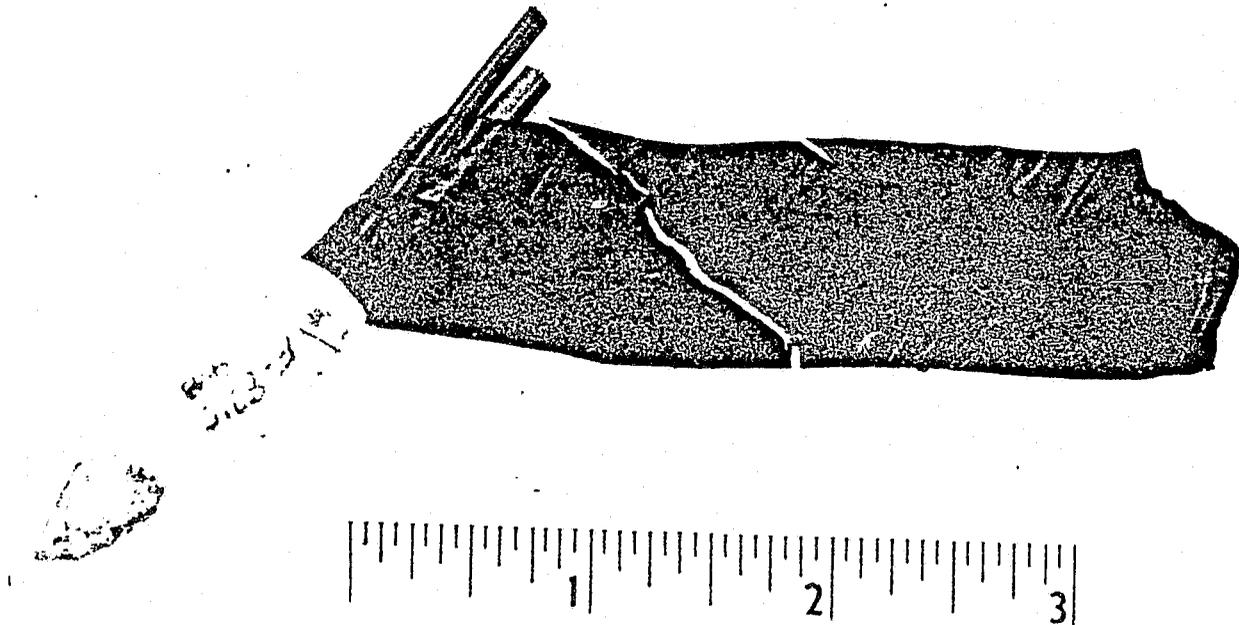


Photo 21B Comparison of plastic tape on wires remaining in victim's car and on cut wires on stolen motor in auto theft case.

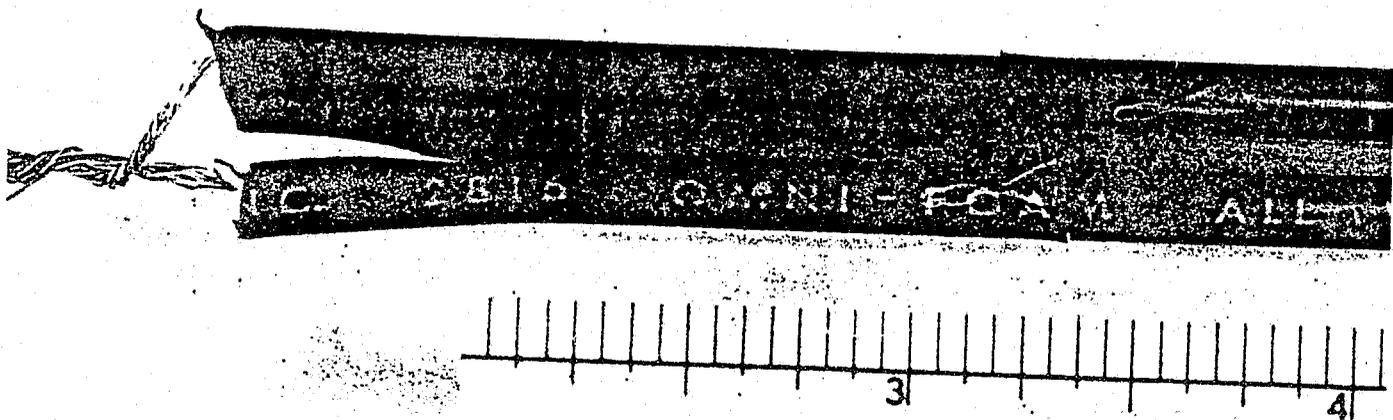


Photo 21C Comparison of cut TV antenna wire on stolen set and wire from house of victim.

I. SOIL

The comparison of soil or dried mud samples on shoes or clothing of suspects with specimens secured in and about crime scenes is frequently of value in burglaries, sex offenses, homicides and other investigations. Periodically, soil samples will also fall from under vehicle fenders at hit-run scenes and comparison with specimens recovered from suspect vehicles may aid in placing the vehicle at the scene. Comparison of samples in such investigations may prove useful but, to have real significance, usually necessitates employment of very careful evidence collection procedures and the securing of numerous samples. Naturally occurring soils consist of rock and mineral fragments, material such as clay, decomposed organic matter, living organisms, chemicals and water. Samples secured from many areas may also contain debris resulting from human habitation or industrial operations. The latter type of debris, if sufficiently varied and unique, will often be of most value in individualizing a specimen. To permit proper evaluation of laboratory findings when only naturally occurring soil is present requires the study of sufficient samples to establish the normal distribution of soil of a particular type in and about the source of the specimen.

1. Firmly Attached Soil Samples

If the soil is firmly attached to some object, as in the case of dried mud on a shoe, do not remove it. Label the object and place it in a bag or some other appropriate container. Always *completely seal* the container so no loss of the specimen can occur. Be certain the sample is dry before packaging.

2. Loose Soil on Clothing

If the soil is loose, for example, in a trouser cuff, shake it all out onto a clean piece of paper. Then, fold the paper several times to enclose the dried soil sample and place this in a plastic envelope or other container which can be sealed completely. Label such containers to show the source of the sample.

3. Soil on Other Objects

In the case of loose soil or mud on the street or in a building, pick up the soil and place the dried sample in a plastic bag, box or jar and seal and mark the container. Attempt to collect the soil without other contaminating material. In the case of hit-run cases, cakes of dried mud may fall to the pavement or road shoulder from under a vehicle fender. In such cases, if contamination may have occurred, attempt to pick up the upper part of specimen only, leaving the contaminated under-

side. Also advise the laboratory concerning the possibility of contamination.

4. Prevent Contamination

Great care must be taken to prevent contamination or loss of samples during shipment. Always place samples in *sealed* plastic or glass containers, if possible. *Do not* use paper envelopes as they invariably leak. If boxes are used, line them with clean paper and seal the box.

5. Damp Soil

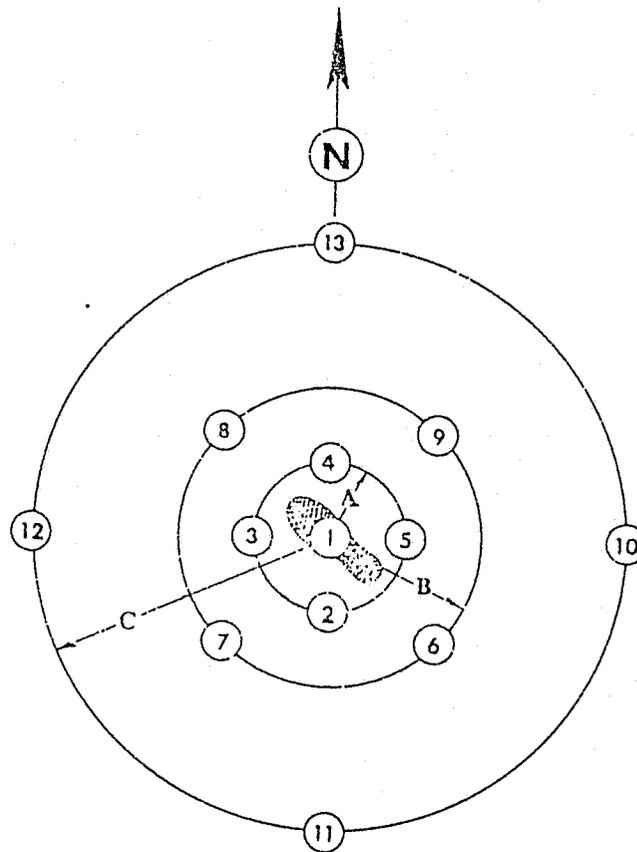
Always dry out damp soil specimens or moist objects containing soil or mud prior to packaging. When sealed in a container while damp, mold growth will occur and organic matter in the soil may decompose. Always seal a lid on soil containers to prevent loss of sample and place suitable markings on the outside of the container.

6. Reference Specimens for Comparison

- a. Collect two to three ounce reference samples from the suspected source of the specimen in question. Also collect samples from many other locations in the vicinity of the crime scene so that the laboratory can determine how much variation there is in the soil in that area. In the case of a footprint in the ground at a residence burglary, collect reference specimens at several locations in the yard at the scene. Also obtain samples from adjoining property. In cases where comparisons of soil from rural areas are desired, collect specimens from various locations in the fields near the crime scene and also from adjoining farms or fields.
- b. An excellent method for securing useful reference specimens in open areas is to first take one or more samples from the scene, footprint, tire print or other similar location. Then additional samples may be collected at distances of approximately 10, 50, and 100 feet in all four compass directions (where soil is present) from the original location. This gives a good picture of the soil conditions and variations in the crime scene area. (See Figure 1, next page.)
- c. If dried mud is present on a suspect's shoes or clothing, question him as to its source. Obtain soil samples from any alibi areas he may mention.
- d. Comparison samples must be representative. If soil on shoes appears to be from the surface where footprints are found, collect surface samples. "Any subsurface-collected specimens may be quite different." If the soil may be from an excavation of some type, collect numerous specimens at different depths and mark the depth at which each was recovered.

PHYSICAL EVIDENCE MANUAL

FIGURE 1



A = 10 ft.
B = 50 ft.
C = 100 ft.

Start at point number 1 (footprint, tire impression, area of obvious scuffle, etc.) and obtain soil samples at each point, 1 through 13. Each sample should be numbered to correspond with the number on the diagram. Record a description of the physical location from where the soil sample was collected (e.g., ditch) and note any unusual conditions in the vicinity (e.g., close to petroleum tank).

- e. If soil recovered at a hit-run scene may have dropped from the fender of the responsible vehicle, collect reference specimens from under each fender of the suspected vehicle. Keep each sample separate and label as to source. Normally, in such cases, only lumps of dried mud have much value. Fine silt from under the fenders of vehicles usually cannot be definitely connected with any specific automobile. In some cases, where a large lump of dried mud is found at an accident scene, it may contain a characteristic shape which can be compared either with mud remaining under a fender or irregularities in the fender of the responsible vehicle.
- f. In most soil comparison cases, numerous comparison specimens are necessary. Normally the more samples that are collected, the more value will be the comparisons conducted.

- g. Collect comparison samples as soon after the crime is discovered as possible. If delays occur, the soil may be altered by cultivation or contamination and thus no satisfactory comparisons can be made.

7. Value of Soil Comparisons

The laboratory conducts a variety of soil analyses to establish the similarity or difference between the samples. If the soil is in any way unusual, the comparisons may have great value. In some cases where similar soil is present over a wide area, such as on a river levee or in the case of beach sand, the comparisons may have little value. Definite conclusions cannot be reached unless complete studies of many samples from the crime scene area are possible.



Photo 22 Soil samples being removed from boots in preparation for further examinations.

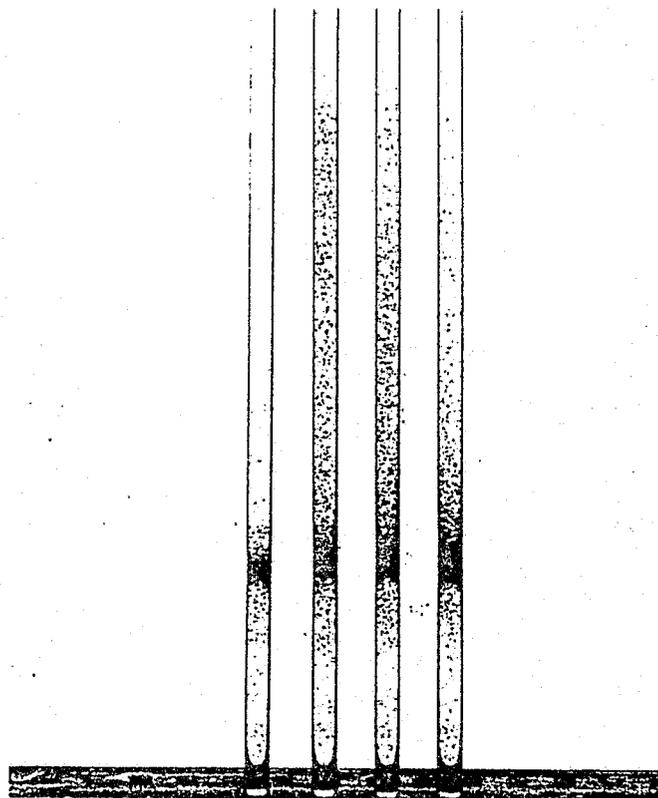


Photo 23 Soil comparison in density gradient columns. The left tubes contain specimens from two locations at a burglary scene. On the right are specimens from the suspect's shoes. Only the samples in the center tubes match.

J. TOOL MARKS

Tool marks are encountered most frequently in burglary cases but may also be found in many other types of crime. The evidence consists of abrasions or impressions left by tools on objects at the crime scene and various types of tools found in the possession of suspects. In many cases it is possible to identify the specific tool which made the questioned marks by means of laboratory comparisons of tools and marked objects. In some instances it is also possible to prove that marks on tools were produced by objects which they contacted at crime scenes. In other cases it is possible to prove, by means of physical or other comparisons, that parts of tools left at crime scenes were broken from damaged tools found in the possession of suspects.

1. Preservation and Packaging of Tools

All areas on recovered tools which contain transferred paint, building materials or other contamination should be wrapped in plastic so that such substances will not be lost. After marking, tools should be wrapped or packaged to prevent the prying blades or cutting edges from contacting any other surface or object. Care should be taken that no tape is placed on the mark or questioned area of the tool when packaging.

2. Make No Tests With Tools

Attempts should never be made to fit tools into questioned marks or to make test marks prior to laboratory examination. If done, the questioned mark or the tool may be altered and this may make any laboratory examination valueless. In addition, traces of transferred paint or other substances on the tool may be lost or additional material may be transferred to the tool.

3. Preservation of Tool Marks

- a. Whenever possible send the whole object containing tool marks to the laboratory instead of just removing the area containing the mark. This is important since, to make satisfactory test marks with the tool, it is necessary to deter-

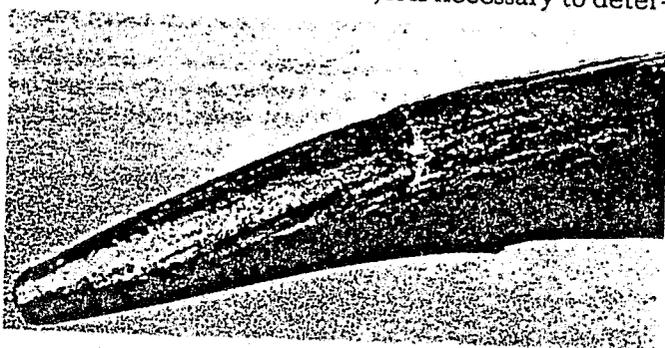


Photo 24 Physical match of metal found in burglarized vending machine and broken end of one of the four tines on an ice breaker tool of a suspect.

mine the direction of motion and the vertical and horizontal angle at which the tool was held when the questioned mark was made. A study of all impressions and abrasions present on an object such as a door jamb or safe, will often indicate the method in which the tool was used much better than an examination of just a small section removed from the safe or other object.

- b. If it is impossible to submit the whole object to the laboratory, remove the tool mark itself. In such cases care should be taken to prevent any damage or alteration of the questioned mark. Always cut off sufficient surrounding material so that no damage will occur. A photograph showing the original location of the mark and its relation to its environment should accompany any removed marks.

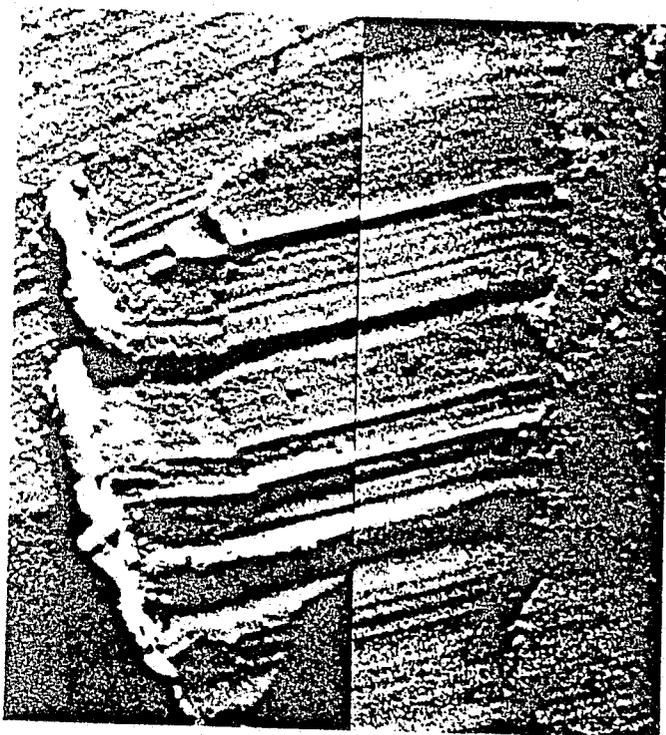


Photo 25 Comparison of tool abrasion mark on door lock (left) and test made on lead with suspect's wrench (right).

- c. While photographs of tool marks at crime scenes may have value in some investigations, they rarely have any value in identifying the particular tool used. The laboratory cannot accurately compare suspected tools with photographs of tool marks, even when the exact magnification of the photographs is known. Photographs which show the whole object as well as the tool mark, however, are of value to indicate methods by which the marks were produced or the orientation of the tool. This information may assist in producing satisfac-

PHYSICAL EVIDENCE MANUAL

tory test marks in the laboratory, therefore such photographs should be included.

- d. Mark the object containing tool marks in some area where the questioned impression or abrasion will not be damaged.
 - e. Pack the object containing tool marks so that no alteration or damage will occur during shipment. Small objects may be placed in envelopes or boxes while important areas on larger objects can be protected with plastic, paper or cardboard. Large objects may be packed in cartons or crates if not delivered in person.
4. Wire Theft
- a. Due to the value of scrap copper, thievery of copper telephone and electric lines, whether in use or abandoned, has become a very frequent occurrence. In numerous cases of this type it is possible to identify bolt cutters, wire cutter pliers, diagonal cutters, pruning shears, and other tools recovered from suspects as being the specific tools employed in cutting wire ends left at the crime scene.
 - b. Under the best circumstances, tool mark comparisons on small wires are difficult. This is due to the fact that only a very short section of the cutter tool blades makes contact with the wire. It is therefore difficult and seldom possible to prove that two different wires were cut with the same tool unless the tool itself is available for study. In those cases where the responsible tool is obtained test markings can be made in the laboratory which will record the structure of all portions of the blade surfaces. In routine

wire theft cases the laboratory cannot compare cut wires recovered at different crime scenes just to establish that the same tool (and therefore the same suspect) was involved. A suspected tool must be recovered first.

5. Examples of Value of Such Evidence

While all applications of tool mark evidence cannot be covered, a few illustrations may indicate its value as evidence.

- a. Hammers may often be identified as being the specific tools which made impressions on safes or other objects.
- b. Screwdriver scrape marks on lock boxes and other objects are often identifiable as having been made by tools found in the possession of suspects. It has also been possible to identify the tool used to remove metal screws at a crime scene.
- c. Pry bars and other similar tools can frequently be identified as having been used to produce marks on doors, window frames, safes and other objects.
- d. Knives have been identified as having made cuts on wood.
- e. Bolt cutters, pliers, tin snips and similar tools can often be identified as being the specific tools used to cut wires, lock hasps, metal bars, sheet metal, etc.
- f. Pipe wrenches can sometimes be identified as having been used to disconnect pipes or twist off other objects such as door knobs.
- g. Axes and hatchets can be compared with cut marks on wood. In several cases, tools have been identified as lethal weapons by comparison with marks on the skulls of victims.

K. FIREARMS EVIDENCE

Firearms are involved in an appreciable percentage of both major and minor crimes. The evidence in such cases is frequently very broad and investigations of the weapons themselves, as well as the events which occurred, may be quite varied. The laboratory is able to assist in many phases of such investigations.

1. Ballistics

The word ballistics is frequently used incorrectly when reference is made to studies of weapons and cases involving firearms. Ballistics is the science that deals with the motion and flight of projectiles. Such studies are of importance in only a limited number of criminal investigations. The laboratory is capable of furnishing scientific aid in connection with some problems related to ballistics. Examples are the establishment of the range, trajectory or penetration power of fired bullets, ricochet pattern studies and the like.

2. Weapon Functioning Tests

Laboratory studies may be conducted to determine trigger pull, operation of safety devices, alteration or modification of weapons, alteration or damage which might make a weapon fire accidentally or be unsafe, general operating condition and related examinations. Whenever such studies are desired the weapon should not be test fired, disassembled or otherwise used, tested or altered prior to the time that it is submitted to the laboratory.



Photo 26 Photograph taken through a comparison microscope showing matching rifling markings on test and question .25 auto bullets.

3. Firearms

- a. Never submit a loaded gun to the laboratory unless it is delivered in person. Unfired cartridges may be left in the magazine provided the magazine is removed from the gun. A firearm with a cartridge in the chamber should never be shipped by any method, even if the weapon is not cocked or is on safety.
- b. Never clean the bore, chamber or cylinder before submitting a firearm and never attempt to fire the gun before it is examined in the laboratory.
- c. Never pick up a weapon by placing a pencil or other object in the end of the barrel.
- d. Record serial number, make and model of the weapon and mark it in some inconspicuous manner before sending it to the laboratory. The marking of many firearms is important since duplicate serial numbers are sometimes found on different guns of the same make and general type. Many guns can be marked on the frame by removing handgrips or butt plates.
- e. Place the weapon in a strong cardboard or wooden box well packed to prevent shifting of the gun in transit.
- f. Rifles or shotguns may be taken apart to make it easier to package and ship, but do not disassemble more than necessary.
- g. If blood or other material of interest is present on the muzzle of the gun, place a small paper bag around the muzzle and seal it to the barrel with plastic tape to prevent loss of the sample during shipment.

4. Bullets

- a. Never mark a bullet on or near the rifling markings on the bullet sides, even if they are not clearly defined. Certain examinations may not be possible if the base or nose is marked even though these are the preferred marking locations. If there is any question don't mark the bullet but seal it in a marked container.
- b. Wrap recovered bullets individually in tissue paper and seal in separate pill boxes or envelopes.
- c. Submit all evidence bullets recovered to the laboratory. A conclusive identification may be possible on only one of several bullets recovered, even when they all appear to be in good condition.
- d. Do not attempt to clean recovered bullets before sending them to the laboratory, except in the case of bullets removed from a body. The latter may be washed off immediately in running water and dried by blotting on a soft dry towel in those cases where the study of fiber and other evidence adhering to the bullet nose

is not of importance.

- e. Handle fired evidence bullets as little as possible to prevent damage to the identification characteristics in the rifling markings or loss of material adhering to the bullets. Never use forceps or other tools to handle bullets.
- f. Wrap each bullet separately in tissue paper to prevent damage to the rifling markings by contact with other evidence.
- g. Place wrapped bullets in envelopes or pill boxes, label and seal the container.

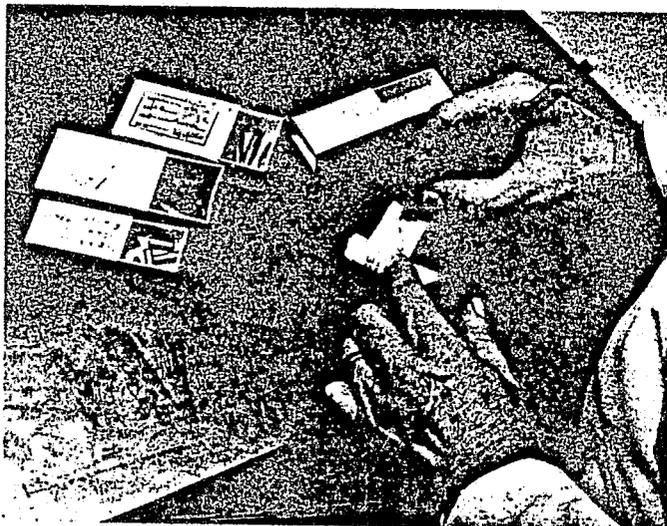


Photo 27 The proper packaging of bullets and cartridge cases includes wrapping of the item in soft tissue.

5. Cartridge Cases

- a. Mark cartridge cases on the inside of the open end, if possible. Use initials or other characteristic marks which are kept as small as possible. Cases may be marked on the outside near the open end but care must be taken not to damage clip or other markings which may be present. Never mark on or near the primer end of the case. Again, if there is any question, seal the cartridge in a marked container.
- b. Fired shotgun shells may be marked either on the inside or the outside of the paper or plastic portion of the shell.
- c. Submit all evidence cartridge cases or shotgun shells recovered to the laboratory. Frequently some cases contain more identifying detail than do others.
- d. Do not attempt to clean recovered cartridge cases before submitting them to the laboratory.
- e. Wrap each cartridge case separately in tissue paper to prevent damage to breech block, firing pin or other markings by contact with other cartridge cases.
- f. Place wrapped cartridge cases in envelopes or pill boxes, label and seal the container.

6. Ammunition

- a. Always attempt to recover unused ammunition for comparison purposes when firearms are obtained as evidence. If not in the weapon itself, subjects often have additional ammunition in their car, clothing, house or at other locations. While the laboratory maintains an adequate supply of cartridges of all types for test purposes, some types are not always available. In addition, it may be important for test purposes to duplicate exactly the make, type and age of the ammunition used in the crime. Other ammunition in the possession of the suspect *frequently* is identical to that fired at the time of the crime.
- b. Unfired ammunition may be marked on the side of the cartridge case, near the bullet end.
- c. Ammunition may be compared to establish similarities in type and manufacture. It is sometimes possible to show that a particular bullet or cartridge came from cartridges manufactured within a specific time period.
- d. In some instances it is possible to prove that hand loaded bullets had a common source or that the cartridges were reloaded with the same tools.

7. Powder or Shot Pattern Tests

- a. Submit clothing and other material showing evidence of gunpowder residue or shot holes. If more than one item, wrap each one separately so as not to disturb or contaminate any residue. When information as to weapon distance at the time of the shooting is needed, photographs of powder patterns on clothing will not suffice since in most instances microscopic examination, chemical testing and x-ray studies must be conducted on the exhibits themselves. When bullets have passed through garments and then into a human body, it is also desirable to have clear photographs of the bullet holes in the body available for study in addition to the garments. Include a ruler in all photographs.

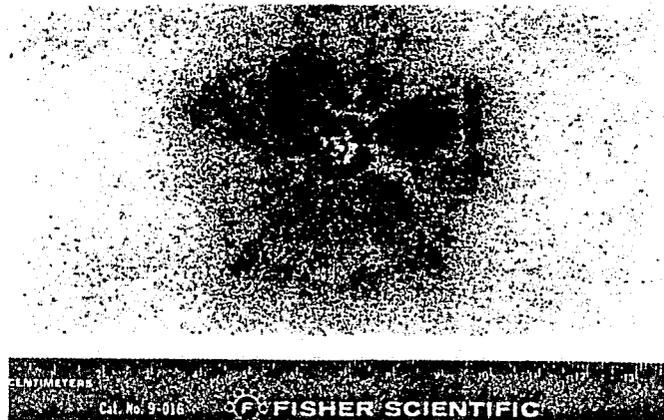


Photo 28 Illustrates the muzzle discharge residue left on a victim's outer garment as a consequence of a close range firearms discharge.

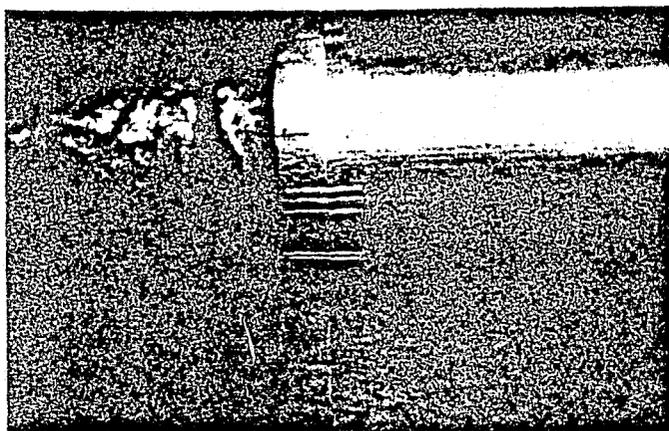


Photo 29 Comparison of reloading equipment die marks on two cartridges. Hold-up victim was shot and killed with his own revolver. Suspect stole the weapon and ammunition. The weapon was never located but cartridges were later found in the suspect's possession. These were compared, as illustrated, with other reloaded cartridges belonging to the victim.

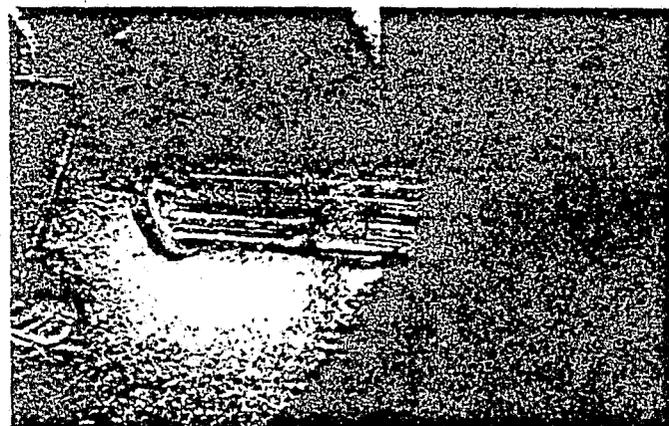


Photo 30 Comparison of firing pin marks on test and questioned .22 calibre cartridge case.

b. For gunpowder or shot pattern tests to have significance, it is essential to obtain ammunition identical in make, type and age to that used in the crime. This duplicate ammunition is necessary for test firing in the weapon in question to determine the distance of the muzzle of the weapon from the victim or other object at the time the questioned bullet was fired.

8. Dermal Nitrate Tests

Many research studies conducted by branch criminalistics laboratories, as well as other laboratories, have established that dermal nitrate and paraffin cast techniques *are worthless* to determine whether or not an individual has fired a weapon. For this reason criminalists of ISB will neither make such casts nor conduct chemical tests on casts made by others for either court or investigative purposes. This does not, however, imply that careful visual examinations or other studies of *unwashed* hands of individuals suspected of having fired weapons should be overlooked.

9. Neutron Activation Analysis (NAA)

- a. Extensive NAA studies have been conducted of swabbings made on the hands of individuals who have fired various weapons, as well as on control subjects. At present, however, this analysis will not, in most instances, conclusively establish whether or not an individual has fired a gun.
- b. The laboratory is equipped to assist any agency in obtaining the proper samples from the hands of a shooting suspect in cases involving firearm residue.
- c. Requests for such assistance should be made directly to the laboratory for evaluation.
- d. The requesting agency should exercise every precaution to protect the hands of subjects from contamination. Paper bags taped over the hands of a "suicide" victim prior to movement is one example of a suitable precaution. Rapid processing of the hands of live subjects is another.
- e. For proper procedures in collecting and submitting samples for gunshot residue analysis, request Physical Evidence Bulletin 15/77, from the laboratory.
- f. The laboratory will not, for scientific reasons, assist in collecting samples from subjects that have washed or if over 4 hours have elapsed from the time of shooting.

10. Trace Metal Detection

- a. In some cases it is possible to demonstrate that a person has recently held a gun in his hand. This procedure requires the spraying of the hands with a chemical that reacts with the metals of the weapon. The hand is then examined and photographed in ultraviolet light.
- b. The laboratory is equipped to conduct the trace metal detection procedure for an agency upon request.
- c. Requests for such assistance should be made to the laboratory for evaluation.
- d. The requesting agency should exercise every precaution to protect the subject's hands. The subject should not be allowed to wash or handle metallic objects.
- e. For more details, request Physical Evidence Bulletin 14/77 from the laboratory.

11. Firearm Investigations

The laboratory can furnish aid in many firearms investigations other than those mentioned above. Such work may involve studies of wounds, direction of bullet paths in bodies, sequence and direction of shots fired through glass and other materials, identification of homemade cartridge components and many other related examinations.

L. SERIAL NUMBER RESTORATION

The eradication of serial number or other manufacturers' markings is frequently carried out to conceal other crimes such as theft. It is also done to prevent tracing ownership of an article. Obliterated or defaced numbers, letters or other stamped markings on metal can usually be made legible by means of various laboratory procedures.

1. Attempts should *never* be made to restore markings. If restoration attempts have previously been carried out by others, the laboratory will not make further attempts at restoration. The reason for this is that the first surface preparation normally removes metal which contains the latent impressions.

2. Weapons

- a. Attempts will be made to restore obliterated or defaced serial numbers or other manufacturers' markings on all types of firearms.
- b. If restoration procedures are successful on pistols and revolvers, the serial number will be automatically checked against the Bureau of Identification firearm registration file for outstanding want or stolen reports.
- c. If the files show no record concerning a restored number, this same number, preceded by the letters "CII", will be restamped on the weapon if this has been requested by the submitting agency. Whenever restamping of restored numbers is requested the Laboratory must be advised of the name and address of the person or agency to whom the firearm is to be registered.

d. When number restorations are unsuccessful a new serial number, preceded by the letters "CII", can be assigned if such a request is made by the submitting agency. In such cases the name and address of the person or agency to whom the firearm is to be registered must be furnished.

e. Serial numbers will *not* be assigned or stamped on rifles and shotguns which did not originally bear a serial number stamped by the manufacturer.

3. Merchandise

a. Attempts will be made to restore or make legible serial number, manufacturer or other distinguishing markings on merchandise having such markings.

b. Such work is conducted only for the purpose of aiding in identification of the merchandise.

c. The Laboratory has no authority to assign numbers or restamp numbers on merchandise.

d. When restorations are necessary on heavy or bulky objects, such as pianos and motorcycles, the laboratory should be contacted by telephone prior to delivery of the exhibit. The submitting agency will be responsible for delivering and retrieving such items. Laboratory facilities *will not* permit storage of such items for more than 15 days. Unless special arrangements have been made, they will be returned and shipping charges collected after that period, unless special arrangements have been made.

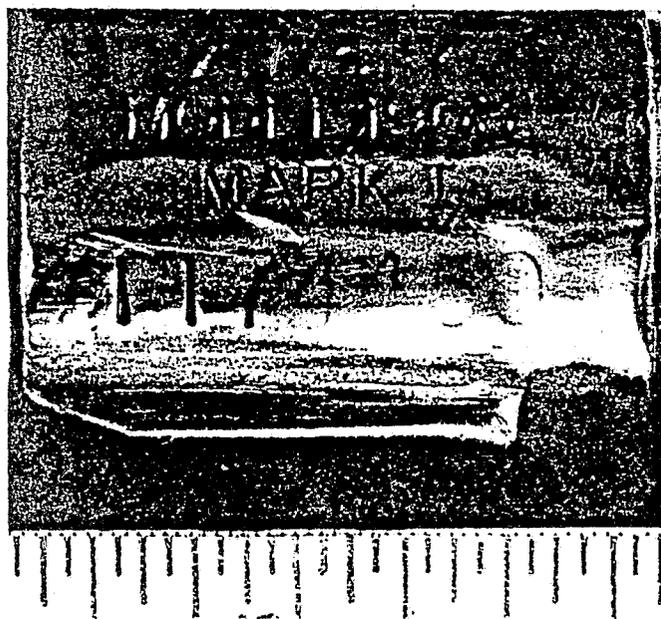


Photo 31 Restoration of the last four serial numbers which had been filed off on a 30.06 rifle. Restoration by means of acid etching.

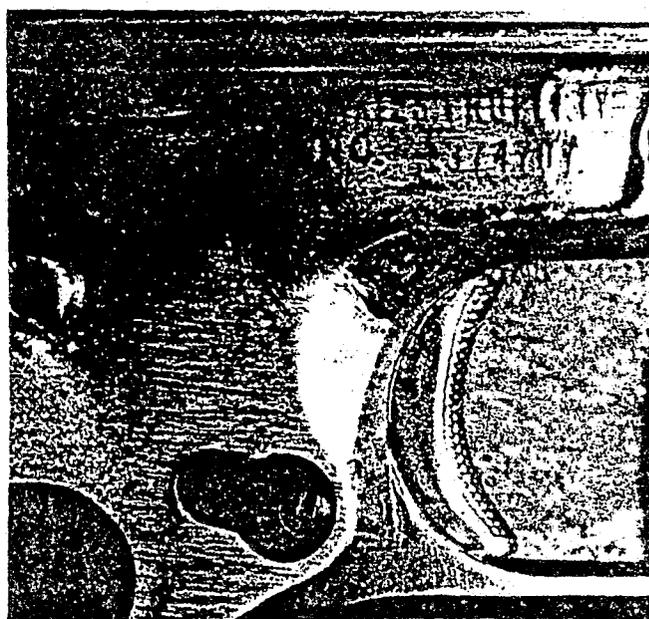


Photo 32 Restoration of an obliterated serial number on a .45 automatic pistol. Restoration by means of Magnaflex technique.

M. FIRE INVESTIGATION AND FLAMMABLE FLUIDS

The types of evidence which may be encountered in a fire investigation are potentially as broad as in any other type of criminal case. The recovery and interpretation of physical evidence in this type of case, however, is frequently complicated due to partial or complete destruction produced by the fire. In the case of large structural fires, exhibits of importance may be covered by debris and therefore be difficult to locate. Firefighting operations, including forcible entry, hose stream damage, ventilation and mop-up, also may cause evidence destruction, affect burn patterns or otherwise alter the scene.

1. Special Procedures Applicable to Fire Investigations

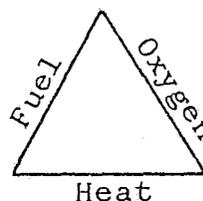
- a. Limit mop-up after the fire is suppressed until a search for all possible physical evidence can be conducted. This is important since normal fire department procedures employed after fire suppression may cause loss of evidence when positions of furniture and other items are altered or material is removed from the scene.
- b. Firefighters observing evidentiary material should be instructed to leave it alone until it can be examined and secured by an experienced fire investigator.
- c. As in all investigations, the search for evidence in fire cases should be conducted systematically and completely. The search should extend throughout the whole area or building involved. Fire sets, which did not ignite or which failed to continue burning, may be present in unburned areas.
- d. Attempts should always be made to reexamine scenes of large fires during daylight hours and after heat and burn odors have been allowed to dissipate. Far more can be observed under natural illumination than at night, even when excellent floodlights are available. Further, smoke and fumes may make the human nose incapable of detecting odors from small quantities of volatile fluids.
- e. As part of any fire investigation, all early arriving firefighters, as well as other persons at the fire scene, should be questioned as to any unusual observations which they might have made. This may assist in locating the point of origin of the fire, establish window and door conditions, indicate unusual flame or smoke colors and quantity, or supply other useful information.

2. The Search for Flammable Fluid at Fire Scenes

- a. Petroleum products and other flammable fluids are one of the most common types of materials employed in arson cases involving

structures.

- b. Even though alcohol, gasoline, stove oil, paint thinners, solvents and other similar fluids are highly volatile and flammable, they frequently do not burn completely. Identifiable residues of such fluids can therefore be recovered in many cases even when large fires have occurred.
- c. The fire triangle illustrates the requirements which must be met if any fire is to occur. If one



of the three essentials is absent or consumed by the burning, the fire will be extinguished. Thus when the flammable fluids soak into upholstery, rugs and other fabrics; plaster or wallboard; flow through floor cracks into underlying soil; seep under molding and into

wood at the base of walls; or collect at other locations, there will often be insufficient oxygen present to support continued combustion. Residue of the volatile fluid employed may therefore, remain, which can be later recovered and identified.

- d. While the establishment of the point of origin of a fire is important, the most complete combustion may occur at this particular location and no flammable fluid residues remain. Once the point of origin is determined, therefore, emphasis should be placed upon a search of this general *area* for materials which are "sponge-like" (such as fabric, wall board or soil) where lack of oxygen may have prevented complete combustion of the flammable fluid.
- e. The search for flammable fluids should be conducted as soon as feasible since many highly volatile fluids will eventually be lost through evaporation. Fortunately, the use of water in fire control assists in slowing the loss of volatile fluids by cooling, covering and insulating materials into which the flammable substances have soaked.
- f. The detection of the most concentrated deposits of many volatile fluids, such as gasoline, by odor may become difficult if much of the fluid is present. This is due to the fact that the human nose loses its sensitivity to many odors if exposed to large quantities over a period of time. Trace amounts of volatile fluid odors may also be masked by other odors at fire scenes. This is particularly true in the case of those produced by burned plastic and rubber.

PHYSICAL EVIDENCE MANUAL

- g. It is important to realize that many flammable fluids have little or no odor. Included are such substances as some alcohols, deodorized kerosene, charcoal lighters, etc.
- h. The search for traces of flammable fluid may be facilitated by use of a highly sensitive combustible vapor detector. The laboratory has such a device and, upon request, will furnish aid in locating traces of flammable fluid at fire scenes.

3. Flammable Fluid Evidence Recovery

- a. Samples of volatile fluids found in open jars or cans should be poured into clean metal or glass containers. The container employed should then be sealed completely to prevent any loss of fluid.
- b. When glass or plastic containers or cans are found at fire scenes which contain just an odor or trace of fluid, seal the container immediately. Where stoppers or jar lids are not available, use aluminum foil and tape. Samples of large amounts of fluid should be removed and placed in some other container as mentioned above but this is difficult or impossible to do when only odors or traces remain. Even when containers appear empty, vapors present may be identifiable if the container has not been burned by the fire. Traces of such fluids may also remain when water from firefighting operations has entered the container.
- c. New clean paint cans are the best storage containers for recovered material suspected of containing flammable fluids. They have lids which may be readily sealed, are not liable to breakage and prevent loss of volatile fluids and vapors. Such cans are available from many paint and hardware stores at low cost. Storage of empty paint cans requires only limited space since cans of pint, quart and gallon size can be nested. Paint cans of these sizes should be stored at locations where they will be readily available for use by all fire departments and fire investigators.



Photo 34 Unused metal paint cans are ideal containers for preserving volatile fire accelerant material.

- d. Glass jars can be used for flammable fluids if they contain lids which can be tightly sealed. Such containers, however, are breakable and thus more difficult to ship. Mason or other jars which have rubber seals on the lids should be avoided since many fluids will soften or dissolve such seals and permit leakage and loss of contents.
 - e. Plastic wrapping when used as jar covers or as a sealant to protect large pieces of wood will not prevent the loss of volatile fluids or vapors. Exhibits suspected of containing such materials should therefore never be stored in plastic containers or plastic wrapping used as a sealant. Likewise, waxed containers are not satisfactory for such exhibits. Aluminum foil can be used in those situations where fluids or debris cannot be sealed in the recommended type paint can.
 - f. Attempt to match the container size to the sample size. The less air space remaining after the sample is added to the container, the better.
 - g. When specimens believed to contain small amounts of flammable fluid are not obviously damp with water, it is preferable to add a small amount of water to the container on top of the specimen. This tends to retard evaporation.
 - h. Identification of trace amounts of fluid in samples recovered frequently requires distillation procedures. This means that specimens must be cut up into relatively small pieces which will fit into glass distillation flasks. For this reason it is normally desirable that the investigator saw or chop large exhibits at the time of evidence recovery and place small pieces in containers. This usually is a superior and easier method than attempting to deliver large sections of wood, carpets and similar exhibits to the laboratory even when the latter can be done rapidly and little loss of fluids is likely to occur.
 - i. Mark All Containers—Include name of person recovering the exhibit, date, time and location of recovery.
 - j. Follow postal or other carrier regulations when shipping evidence containing flammable fluids.
 - k. Telephone the laboratory for instructions prior to personal delivery of large quantities of flammable fluids.
- ### 4. Flammable Fluid Analyses
- a. Even when present in minute amounts or as residues from which the more volatile fractions have been lost, it is frequently possible to identify the original fluid employed.
 - b. Advise the laboratory of any odors noted at the fire scene or other evidence available which suggests that specific fluids were employed. This may save considerable time which might

PHYSICAL EVIDENCE MANUAL

otherwise be required if complete analyses for all types of volatile substances were necessary.

- c. Comparisons are sometimes possible between residues recovered at the scene and samples of volatile fluids obtained from suspects. In some instances it is likewise possible to indicate common origin of different flammable fluid specimens recovered in gasoline theft and other investigations as well as in arson cases. This type of study may be very complex and will usually require special sample recovery procedures. For this reason the laboratory should always be contacted by telephone for special instructions when this type of study is necessary. This will insure that all necessary standard and control samples are properly secured.



Photo 35 Comparison of torn end of burned match (lower right) found at arson scene and layer of paper matches from folder in suspect's pocket.

5. Other Arson Evidence

- Mechanical, electrical or other fire ignition devices may be identified as to their nature and operation even if burned in a fire. All parts of such devices should be searched for and recovered. It may also be possible to compare the recovered evidence with similar material found in the possession of a suspect.
- Residues from fusee and other chemical igniters or fuels are usually identifiable.
- Candle wax can be identified as to type and compared with candles or wax deposits on clothing or other objects found in the possession of suspects.
- All other types of evidence covered in this manual may also be involved in fire investigation cases.

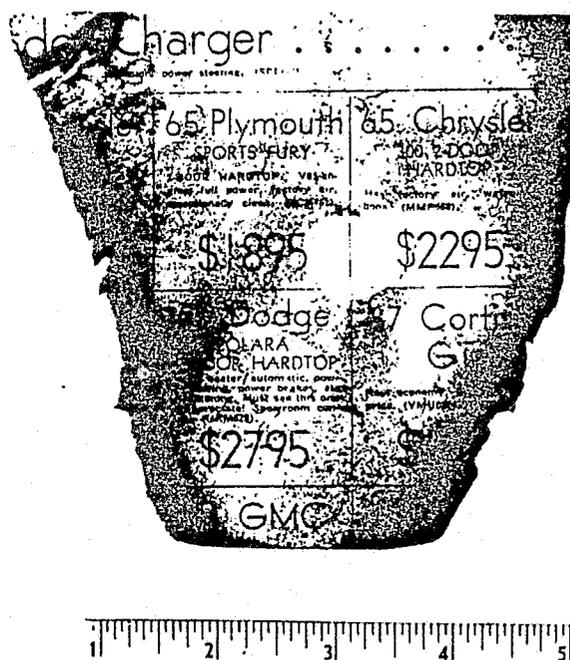


Photo 36 In an arson case sections of 16 consecutive pages of a newspaper were found between two plastic bottles of gasoline in an attic. Holes had been cut in the papers to support a candle. The photograph illustrates one of the papers found in the fire set with another small paper, which was found in a waste basket in the suspect's home, inserted into the hole.

N. EXPLOSIONS AND BOMBS

The use of explosives in criminal activities has increased materially in recent years. This has resulted in evidence such as hand-thrown explosives and fire bombs as well as unexploded bombs and related devices frequently coming to the attention of law enforcement agencies. Investigations of explosions which have already occurred are likewise periodically necessary. The latter may range from minor malicious damage to a locker or personal mail box to major damage in a large building. In all such cases it is possible that individuals may be killed, or at least lives endangered. The evidence involved in such crimes is somewhat different than in most other offenses due to the danger of unexploded devices and the limited amount of evidence remaining after many of them explode. Alcohol, Tax, Tobacco and Firearms offers extensive scene investigation and laboratory services with respect to bombings. Consequently you should consider contacting them in regards to a bombing before contacting the State Department of Justice. The Department of Justice Regional Laboratories will render assistance whenever possible in such cases but certain restrictions on handling of the evidence are necessary. **IN NO CASE** should unexploded bombs or explosives be either *delivered or shipped to the laboratories* since they are located in public buildings. Likewise, federal and state laws restrict the transportation of such materials. **IN ALL INSTANCES** telephone the laboratory for instructions prior to attempting to ship or deliver any dangerous materials.

1. Cases Where Explosions Have Occurred

a. Explosion Scenes

- (1) Limit access to area to as few individuals as possible.
- (2) Photograph exterior and interior of all damaged areas completely.
- (3) Search for all possible bomb parts, fuses, residue deposits; photograph these prior to removal.
- (4) Request assistance of a criminalist from either ISB or a local law enforcement laboratory. While only a few criminalists are explosive experts, they frequently can furnish useful aid in investigations conducted at explosion scenes. Unless much of the explosive device employed remains after the explosion and can be recovered, the greatest information is usually obtained from the crime scene examination rather than study of residues alone.
- (5) Consult with military or civilian explosives experts if available. It must be realized, however, that many such experts have spe-

cialized knowledge concerning only specific types of explosives with which they regularly work.

b. Evidence Recovery

- (1) Make certain that no attempt is made to remove or recover exhibits which may still be dangerous to life until they have been examined by a competent expert.
- (2) Criminalists will **NOT** conduct crime scene examinations of unexploded bombs and related devices.
- (3) Nondangerous bomb parts, electrical detonator, fuse and residue deposits located should always be photographed as found prior to removal. Each item recovered should also be placed in a separate container and marked as to the exact location where it was found.
- (4) Contact the laboratory by telephone if aid is desired in any phase of the evidence recovery.

c. Laboratory Examinations

- (1) Ship evidence to the laboratory **ONLY** if it is **KNOWN** to be safe. If any doubt exists telephone the laboratory prior to shipping or delivering exhibits.
- (2) **ALWAYS** include a complete report of all investigative findings which relate to the explosion or residues obtained.
- (3) **ALWAYS** include copies of all photographs taken at the scene.
- (4) The laboratory will attempt to identify any devices or residue recovered. Many military as well as commercial explosives, however, cannot be specifically identified from the residues remaining after an explosion.

2. Unexploded Bombs and Commercial Explosives

- a. The criminalistics laboratories **DO NOT** conduct field examinations on unexploded bombs nor do they deactivate bombs.
- b. **DO NOT** ship or deliver any dangerous chemicals, powders, explosives or bombs to the laboratories.
- c. Aid in deactivation may be available through local military explosives specialists. If none are available contact the laboratories by telephone.
- d. Deactivated bombs or explosives will be examined but always contact the laboratories by telephone for instructions prior to shipping or personally delivering such materials.
- e. Bomb parts, tool marks, or other deposits thereon, chemical residues, fuses and other

materials may be identified as to source or they may be compared with related materials recovered in the possession of suspects.

3. Fire Bombs

- a. A variety of fire bombs are available or can be readily made by many students, activists or other individuals. The most common type is the "Molotov cocktail". This usually contains gasoline or gasoline mixed with other materials. They may be ignited with a burning wick or contain chemical or explosive igniters.

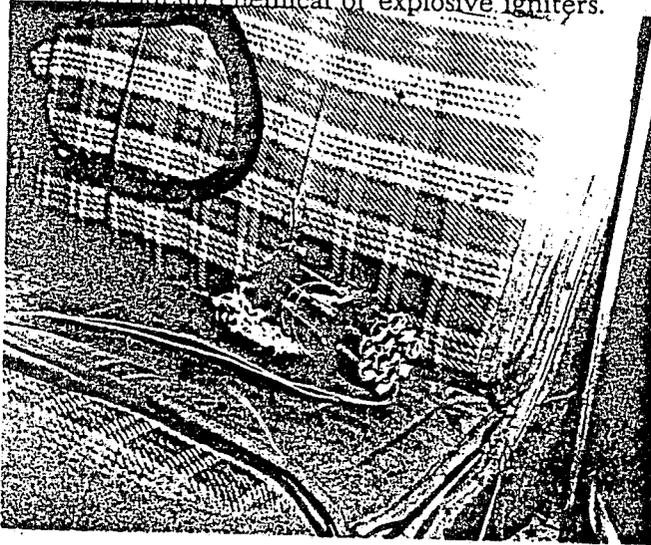


Photo 37 Dynamite charge containing electric fuse wired to light switch in automobile of intended victim. Charge originally placed under seat but was detected and removed by the victim.

- b. When unused fire bombs are recovered and laboratory study is desired, contact the laboratories by telephone prior to making delivery of the evidence. In no case may such devices be shipped.
- c. Residue remaining after a fire bomb has burned out may be either shipped or delivered personally to the laboratories. When this is done it is important to make certain that all flammable fluids have been removed and sealed in a metal container. When such materials are to be shipped, follow postal or other carrier requirements. Even when personally delivered, safety precautions should be taken to prevent injury to both the individual delivering the material and all other persons.

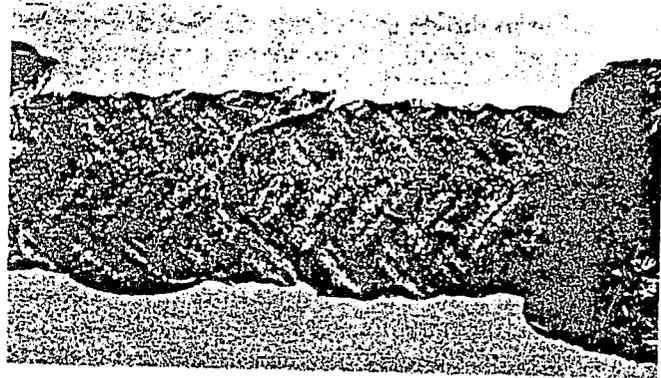


Photo 38 Electric blasting cap inserted in dynamite charge shown in Photo 37 was connected to a light switch wire in the vehicle. This illustrates the comparison of cut insulation on the switch wire from the car with another section of wire found in the possession of a suspect.

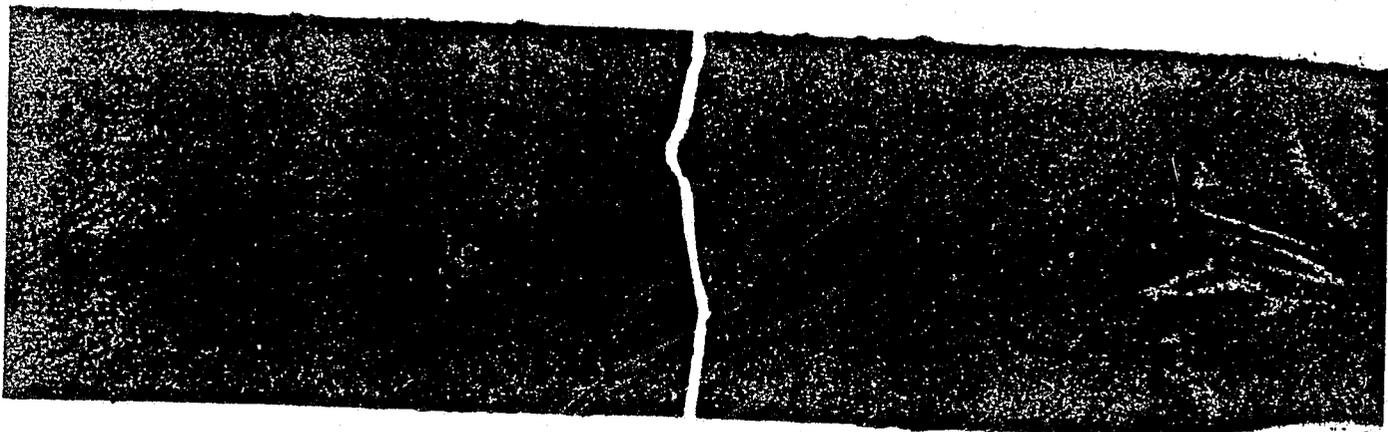


Photo 38A Electrical tape end from roll of suspect and end of tape found wrapped around detonator wires on bomb.

O. CONTROLLED SUBSTANCES

Controlled substances for the purposes of this manual are prohibited drugs and narcotics covered by the Health and Safety Code. Controlled substances analysis is offered by each Department of Justice Laboratory.

1. Sampling

- a. Only items for examination should be included in the evidence package. No money or identification should be included in the package submitted, nor should paraphernalia unless its analysis is essential to the case. Also, weapons should not be included unless an examination is desired.
- b. Drugs for examination should be randomly sampled and only the sample submitted to the laboratory i.e., 5 kilos of suspected marijuana submitted from a total seizure of several hundred. Sampling should never be below the basic packaging unit i.e., samples should not be taken from a kilo, dime bag, piece, etc., the entire basic package should be submitted.

2. Packaging

- a. Items for examination should be independently packaged and marked and the outer container for the group of items should be sealed in order to protect chain of custody.
- b. When paraphernalia is submitted for analysis care should be taken in its packaging i.e.,

needles should always be capped or guarded to prevent accidental injury to the criminalist.

- c. Fresh plant material should not be packaged in plastic bags in order to prevent molding.

3. Submission Forms—Contact the laboratory for instructions.

- a. The Controlled Substances Evidence Envelope (ISB-17) is available for use by the agencies. All pertinent information should be furnished.
- b. If the case is comprised of five items or less the Controlled Substances Evidence Report (ISB-18) must accompany the evidence. The form is to be attached to the outside of the container and should be completed as to all the information required.
- c. If the case is comprised of over five items the regular evidence submission form (ISB-4) should be used instead of the ISB-18. Physical Evidence Bulletin 25/77 on Controlled Substances is available from the DOJ laboratories.

4. Clandestine Laboratories

If seizure of a clandestine drug laboratory is planned, criminalists from the regional laboratories are available and should be consulted as to hazardous chemical handling, possible nature of the drug being synthesized and particular chemicals which are of evidentiary value. Physical Evidence Bulletin 26/77 on clandestine laboratories is available from the DOJ laboratories.

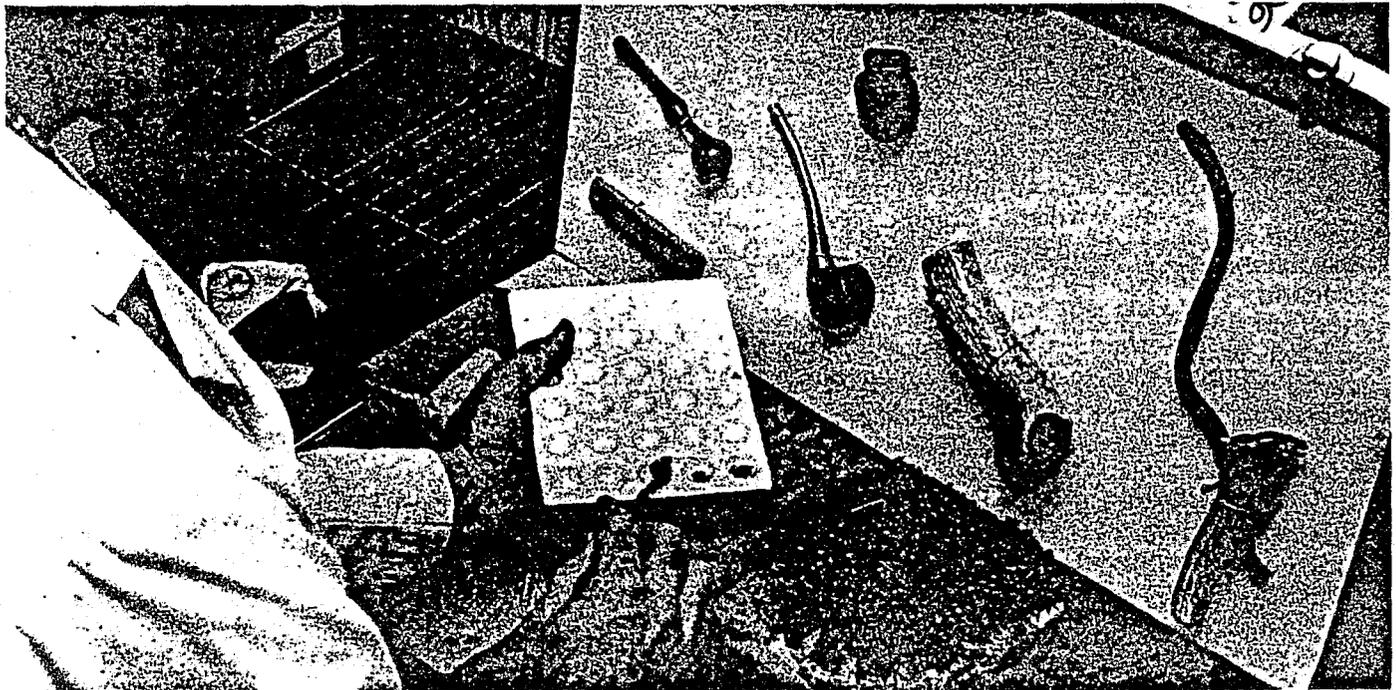


Photo 39 Samples of marijuana being taken for testing purposes

P. BLOOD ALCOHOL

The Blood Alcohol concentration of individuals is of importance to law enforcement officers. It has a direct bearing on the individual's ability to drive an automobile. When the amount of alcohol present is sufficient to impair vision, decrease reaction time and effect muscular coordination it can be concluded that the individual is under the influence of alcohol. Blood, breath, or urine samples can be collected for the determination of an individual's blood alcohol level.

1. *Legal Implications.* The collecting, handling and analysis of samples taken for the purpose of blood alcohol determination is regulated by the California Administrative Code, Title 17, Public Health.

2. *Blood Collection.* Blood samples shall be collected by venipuncture from living individuals as soon as feasible after an alleged offense and only by persons authorized by Section 13354 of the Vehicle Code. Sufficient blood shall be collected to permit duplicate determinations.

(a) *Disinfectant.* Alcohol or other volatile organic disinfectant shall not be used to clean the skin where a specimen is to be collected. Aqueous benzalkonium chloride (ze-phiran), aqueous merthiolate, or other suitable aqueous disinfectant shall be used.

(b) *Equipment for Collection of Blood Samples.*

(1) Sterile, dry hypodermic needles and syringes shall be used. Reusable equipment, if used, shall not be cleaned or kept in alcohol or other volatile organic solvent.

(2) The blood sample shall be deposited into a clean, dry container which is closed with an inert stopper. Alcohol or other volatile organic solvent shall not be used to clean the container. The blood shall be mixed with an anticoagulant and a preservative.

(c) *Post-mortem Collection.* All practical precautions to insure an uncontaminated sample must be employed, such as:

(1) Samples shall be obtained prior to the start of any embalming procedure. Blood samples shall not be collected from the circulatory system effluent during arterial injection of embalming fluid.

(2) Care shall be taken to avoid contamination by alcohol from the gastrointestinal tract directly or by diffusion

therefrom. The sample shall be taken from a major vein or heart.

3. *Urine Collection.* The only approved urine sample shall be a sample collected no sooner than twenty minutes after first voiding the bladder. The specimen shall be deposited in a clean, dry container which also contains a preservative.

4. *Breath Collection.* A breath sample shall be expired breath which is essentially alveolar in composition. The quantity of the breath sample shall be established by direct volumetric measurement. The breath sample shall be collected only after the subject has been under continuous observation for at least fifteen minutes prior to collection of the breath sample, during which time the subject must not have ingested alcoholic beverages or other fluids, vomited, eaten, or smoked.

5. *Interpretation of Blood Alcohol Levels.* For the past forty years scientists have been formally studying the correlation of blood alcohol levels to driving impairments. Literally thousands of people have been included in these studies on motor vehicle accidents, laboratory findings, driving tests, etc. This has established a firm basis for correlating blood alcohol levels to driving impairment. Criminalists in the State Laboratory System are prepared to testify regarding these correlations.

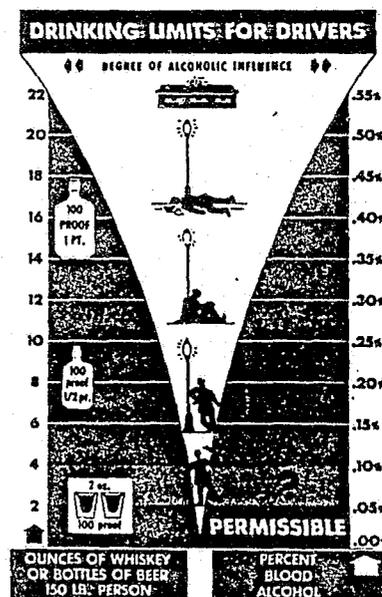


Photo 40 Blood alcohol chart illustrating degrees of impairment and blood alcohol level.

Q. DRIVING WITH DRUGS (DWD)

The California Department of Justice maintains an analytical capability for determining the occurrence of drugs in samples of blood and urine taken from impaired drivers. Samples of blood and urine submitted to this program, and especially those where a blood alcohol content is low or not present, can be analyzed for drug analysis. Samples for analysis should be selected based upon a request originating with the prosecuting agency in cases relating to impaired driving only.



Photo 41 Low levels of drugs in body fluids are isolated by chemical extraction from blood and urine.

1. Submitting Samples

When samples of blood or urine are submitted for drug analysis, any reference made to the discovery of solid dosage drugs in possession of the driver as reported in the arrest record should be cited. This will greatly simplify the analysis time as it focuses the laboratory work on a specific substance and avoids the necessity of searching through an entire class. At least ten milliliters (approximately $\frac{1}{2}$ oz.) of blood and at least 20 milliliters (approximately $\frac{2}{3}$ oz.) of urine are required for drug analysis.

2. Drugs Detected

Department of Justice Criminalists will provide drug analysis from submitting agencies statewide. While the DWD program endeavors to identify a number of drugs including common tranquilizers, not every drug in existence will lend itself to analytical procedures.

For a detailed listing of drugs that can be assayed in this program, see Physical Evidence Bulletin 8/77 available from DOJ laboratories.

3. Gas Chromatograph/Mass Spectrometer

Analysis for drugs in the blood or urine of impaired drivers can require complex laboratory procedures culminating in instrumental analysis. In such instances, the gas chromatograph/mass spectrometer can be used either to detect exceedingly low levels of drugs in human fluids or to confirm suspected drugs whose presence is indicated by other techniques.



Photo 42 The gas chromatograph/mass spectrometer system available to the DWD program and selected samples from the crime lab system.

4. Program Function and Courtroom Testimony

The DWD program is centralized in the Sacramento Regional Laboratory for the purpose of providing an efficient response and complete analysis to the variety of samples submitted. Requests for drug analysis will originate through various regional and satellite laboratories normally serving the requesting agency. Department of Justice criminalists will provide analysis for those drugs that can be determined in either blood or urine by procedures currently available. Courtroom testimony is limited to the actual analysis only and may not include an interpretation of how the detected drug, whether alone or in concert with other substances present in blood or urine, impairs the driving ability of the subject. Submitting agencies are advised that this type of testimony is best provided by local doctors or clinicians professionally established in various localities throughout the state. Questions concerning DWD analysis should be directed to the regional laboratory nearest the requesting agency.

VIII. LATENT PRINT SECTION

In many instances, an entire prosecution case will rest on a positive latent print identification. Without print identifications, many criminal cases would never reach the prosecution level. The Latent Print Section is staffed by experienced latent print analysts having substantial backgrounds in the identification field. All are qualified to appear in court and provide expert testimony in matters of latent print examinations. In addition, latent print analysts may provide field assistance in the investigation of major cases or where trained identification officers are not available to the local agency as per the guidelines in Section XIII of the manual.

A. Latent print examinations and comparisons are conducted by latent print analysts, not by criminalists. For this reason all packages containing only such evidence which are shipped to the Branch should be marked Attention: Latent Print Section.

B. Marking of Latent Print Evidence

1. All evidence should be marked in some distinctive manner, as is the case with any other type of physical evidence.



Photo 43 Latent Print Examiner processing the inside of an automobile for the presence of fingerprints.

2. Lifted, developed latent imprints should also be marked or sealed in marked envelopes.
3. When photographs are taken of developed latent impressions, some type of identifying mark should be placed near the print and this mark should also be photographed so that it will show on the negative. If a 1:1 fingerprint camera is not used, a ruler or some other item should be included in the photograph to show the amount of magnification.

C. Preservation of Latent Print Evidence

1. In all cases it is of the utmost importance to prevent contamination of physical evidence by subsequent handling which can cause destruction of those prints already present.
2. Most fingerprints submitted will be on paper, glass, metal or other smooth surfaced objects. When articles which may contain latent fingerprints must be picked up, they should always be touched as little as possible, and then only in areas least likely to contain identifiable latent imprints, such as where the surface is very rough.

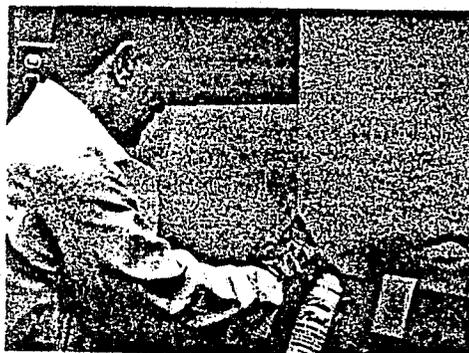


Photo 44A Latent prints on paper being sprayed with ninhydrin solution.



Photo 44B Latent prints being visualized on paper after being sprayed with ninhydrin.

PHYSICAL EVIDENCE MANUAL

3. While gloves or a handkerchief may be used to pick up items of evidence, any unnecessary contact should be avoided. Although this method of handling exhibits will prevent leaving additional prints on the articles, the gloves or cloth used may destroy prints originally present unless great care is exercised.
4. Large articles containing latent impressions such as glass, metal articles and firearms should be placed on wood or heavy cardboard and fastened down firmly with string or wire to prevent shifting and contact with other objects in transit. Where such evidence is to be submitted frequently, a peg board should be obtained on which wooden pegs can be moved as desired to surround exhibits and keep them from moving. Bottles and glasses can be placed vertically on a board and placed in the bottom of a box. The base of the bottle or glass can be surrounded with nails to hold it in place and the mouth can be either inserted through a hole in a piece of cardboard or held in position with a wooden board nailed to the lid of the container.
5. Papers and documents containing latent prints should be placed individually in manila envelopes or plastic containers. Such containers can be placed between two sheets of stiff cardboard and wrapped or placed in a box for mailing.
6. If the object containing the fingerprints cannot be removed or submitted to the Department, dust the prints with suitable developing powders and lift with latent print lifters. Lifted

prints can be placed on black or white cards for contrast or on transparent backing material.

D. Comparison Prints

1. If any suspects are known to the investigator, submit clear rolled fingerprints and palm impressions of such individuals. If these cannot be obtained, advise the Department of the full name CII or booking number if possible and the description of the suspect. Although a file of palm impressions is not maintained in the Department, this information will permit a search of the Department files for a fingerprint record of the suspect. If his fingerprints are on file they can be used for preliminary comparisons with any latent imprints developed.
2. Submit fingerprint cards of any other individuals who may legitimately have handled the objects to be examined, either before or after the crime was committed. Include fingerprint cards of any investigators who may have accidentally touched the exhibits. This will permit the rapid elimination of any latent impressions found which were made by such individuals.
3. Advise the Department of all modus operandi information available and include a copy of the crime report. In some cases, where such data is included, a search of the Department files will reveal the names and fingerprint cards of possible suspects who have previously been involved in similar crimes and who use the same method of operation. When this is possible, the fingerprints of such persons can be immediately compared with the developed latent prints.

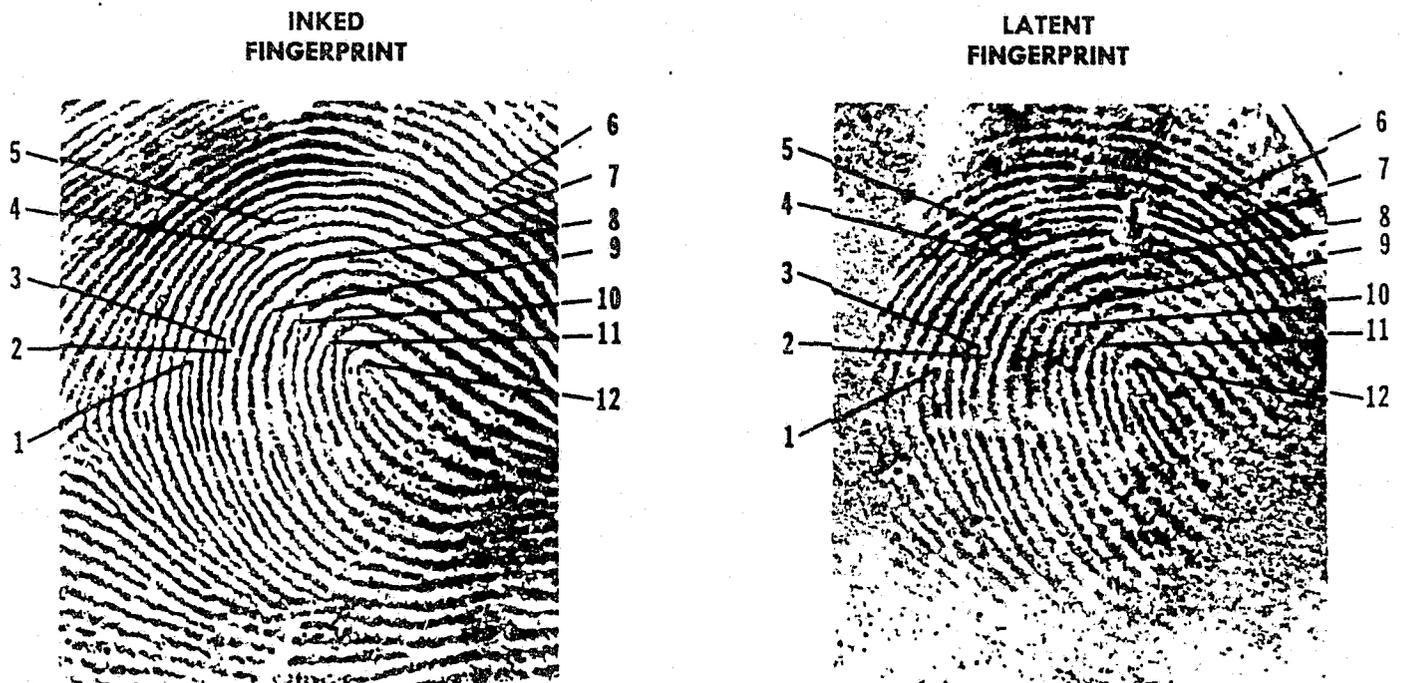


Photo 45 Some common points of comparison between a latent fingerprint and a test print from a suspect.

IX. QUESTIONED DOCUMENTS

A. Services Available

All examinations involving questioned documents submitted to the Branch are conducted by questioned document examiners. These individuals are prepared to conduct examinations concerning any question which may arise in a criminal investigation in regard to the authenticity of a document or the materials used in the preparation thereof. All such experts are fully qualified by training and experience to conduct examinations of such evidence and have qualified and testified as expert witnesses in this field on numerous occasions.

B. Questioned Material to be Submitted

All *questioned documents* involved in a particular investigation should be submitted for examination. This is important since questioned documents are identified by a combination of identifiable characteristics plus an absence of divergencies or dissimilarities. In order to make an identification, sufficient handwriting, typewriting or other evidence must be available upon which to base an opinion. This means that *all* questioned material is needed as well as sufficient exemplar or known specimens.

C. Originals vs Copies

If at all possible submit the original documents, questioned and known, for examination. Photographs, Xerox, carbon and other copies are usually less than adequate for this type of examination. Under some circumstances documents other than originals may be submitted for examination but usually the results will be less than a conclusive opinion. The examiner should always be given the opportunity to examine all of the originals prior to court testimony.

D. It is *absolutely essential* that the document examiner have available the required amount of specimen material to afford a proper basis for an identification. The investigating officer should not expect that the document examiner can satisfactorily examine questioned material when driver's licenses, fingerprint cards, or other material containing only signatures of the subject are submitted as exemplars of known writing. An exception to this might be a case in which the only writing in question is a subject's signature. It is the best policy to collect all available writing or other material in order that the scope of natural variation may be determined.

In order that proper exemplars or standards be obtained, the investigator should always follow the suggestions given below:

1. Exercise caution in obtaining exemplars in order that all specimens collected will be admissible in court. The prosecutor or document examiner should be consulted for advice as to proper procedures to follow in this respect. Usually, any business records, such as bank, utility or municipal records and other similar forms can be utilized.
2. Obtain handwriting or handprinting exemplars when the subject is first interviewed. Most subjects will supply enough specimen writing at this time to facilitate comparisons. At a later date, suitable material may be obtained only with great difficulty.
3. Obtain exemplar writing by having the suspect write his name and address several times. After this has been done, *always* include the exact wording of the questioned material written from *dictation*. This should be repeated on *separate* sheets of paper as many times as necessary to reflect the normal writing of the suspect (15 to 20 pages).
4. Duplicate the conditions surrounding the preparation of the questioned document as nearly as possible when obtaining request exemplars. Use the same color and type of paper, supplying blank checks if checks are questioned or voided credit cards if credit card signatures are questioned, etc. If a pen was used to write the questioned material, have the suspect write the exemplars with the same color of ink and type of pen. Normally, it is possible for the investigator to distinguish between ball point, fountain pen, and nib pen writing. If a pencil was used originally, a pencil of approximately the same hardness and color should be used in obtaining the exemplars.
5. To ensure that no distortion or disguise was

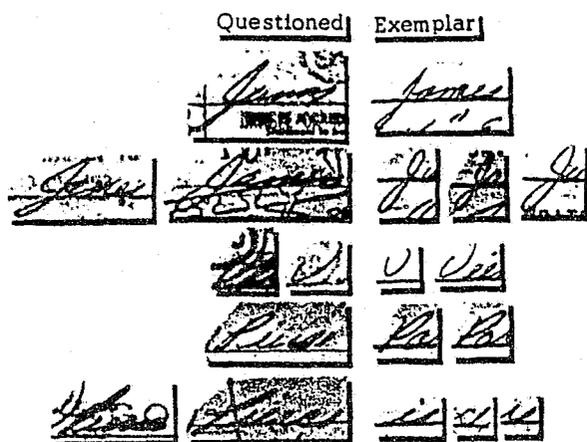


Photo 46 Comparison of signatures on questioned checks and credit card invoices.

made by the suspect when the above dictated samples were secured, a quantity of collected specimens of the suspect's normal writing should also be obtained. These can be almost any type of license, application, signature identification card, personal letters, canceled checks or similar writing which approximate the date of the questioned document. Care must be taken to insure that such collected specimens are genuine so that they are admissible as court exhibits. To make a proper determination in cases of suspected forgery it is suggested that both dictated and collected genuine signatures also be obtained from the person whose name was forged.

6. When securing typewriting exemplars several copies of the questioned document should be made on the suspected machine, using light, medium and heavy touches. At least one copy should be made with the ribbon removed from the machine, or the ribbon control set on "stencil" and the keys allowed to strike directly on a sheet of new carbon paper which should be inserted on top of the paper used for the specimen. This provides clear-cut exemplars of any machine's type face, showing any disfigurements in type characters. Always type the exemplars on the same type and color of paper as that used on the questioned document.
7. Typewriters generally have one of two types of ribbons. The first and most common is cloth made of cotton or nylon impregnated with ink. The less common is a plastic ribbon that is used once and discarded. It gives a clear, sharp impression. In some cases the type marks left on the ribbon can be used to identify a machine or document and can be your most important piece of evidence. This same principle may be applied to cash registers and check protectors. The numerous marking machines, rubber stamps, merchandise markers, both tape or contact should not be overlooked as a possible means of identification.

D. Preservation of Questioned Documents

1. Under no circumstances should either the questioned document or the exemplars be marred, defaced, or altered. No new fold should be made nor should marks or notes be placed on such material.
2. Personal marks for identification purposes should be made as small as possible, on the back or on other areas of the documents where no handwriting or typewriting is present.
3. Whenever possible, all documents should be protected by placing them in cellophane envelopes.

E. Charred Documents

Where the examination and decipherment of writing on charred paper is involved, great care

must be taken to prevent any additional crumbling or breaking apart of the burned material. Normally, it should be placed on top of loose cotton in a box and delivered in person to the Department. No matter how it is packaged, most such material will be damaged if attempts are made to ship it by mail.

F. Other Questioned Document Evidence

In addition to handwriting and typewriting comparisons and the decipherment of charred documents, many other related examinations can be conducted by the Department. These include, but are not limited to:

1. Restoration or decipherment of altered, obliterated or erased writing.
2. Comparison of check protectors and rubber stamps with questioned printing.
3. Identification of embossed or indented writing or typing.
4. Comparison of paper and commercially printed material such as checks, coupons, receipts and others.
5. Physical matching of cut or torn paper of various types.
6. Problems relating to inks.

G. Shipment of Evidence

1. When advance arrangements are made to make certain that a questioned document examiner is present, such evidence may be delivered to the Department in person.
2. When such evidence is sent to the Department by mail, it should normally be sent by certified or registered first class mail. If the amount of material is large, it may be also sent by some other method, but in all cases the package should be sealed.

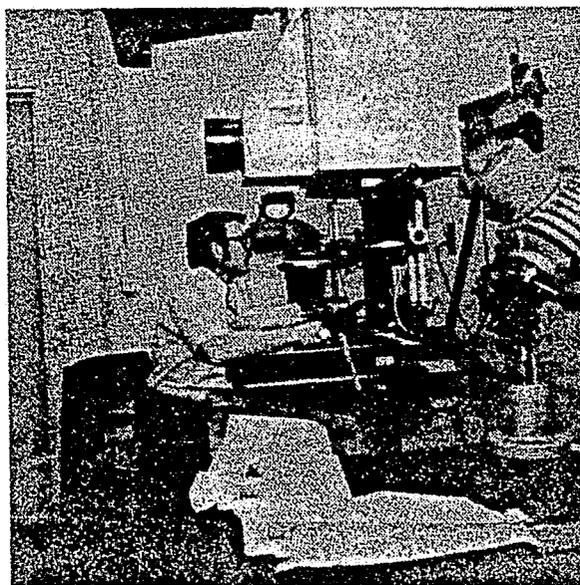


Photo 47 The infrared image converter is used to examine an endorsement which has been obliterated by a bank stamp.

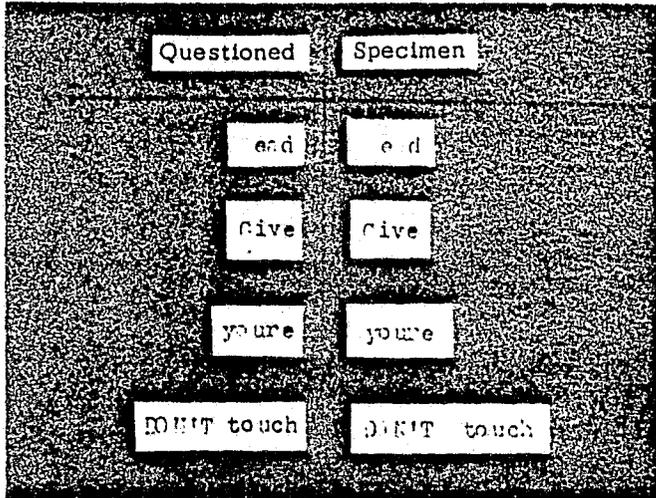


Photo 48 Comparison of a typewritten robbery demand note with the typing of typewriter found at the residence of a suspect. Note: Light striking capital R and small a, capital G lighter at the bottom than at the top, capital O and small o striking to the left of center and above the base line and the dirty small e. These points of comparison conclusively prove that the same typewriter was used to prepare both the questioned and specimen writing.

H. Court Decisions Regarding Exemplars

There have been several California and United States Supreme Court decisions regarding the taking of handwriting exemplars by court order. Numerous California courts have held that the taking of exemplars by an investigator during the investigation of a crime and prior to obtaining a complaint does not violate the defendant's right against self-incrimination. Here briefly outlined, are a few of these court decisions.

SCHMERBER vs. California, 384 U.S. 757; 86 S. Ct. 1826 (1966) "Handwriting exemplars are merely an identifying physical characteristic outside the protection of the Fifth Amendment, like fingerprints, photographs, or requiring a defendant to speak, gesture or walk in a particular manner."

GILBERT vs. California, 388 U.S. 263; 87 S. Ct. 1951 (1967) "The taking of exemplars did not violate petitioner's Fifth Amendment privilege against self incrimination."

LEWIS vs. United States, (D.C.Cir. 1967) 382 F. 2d 816, 818, cert. den. 389 U.S. 962. Chief Justice Berger wrote, "A defendant could be compelled to furnish handwriting exemplars without violation of the Fifth Amendment since an exemplar is relevant only for the shape and direction of some lines and marks which may identify the writer as fingerprints and photographs do."

RINGER vs. United States, 364 F.2d 1083 (8th Cir. 1972). "Asking the defendant to write the words which were written on a forged instrument did not require *Miranda* warnings; it merely provided more reliable physical evidence."

United States vs. Dow, 457 F.2d 895 (2d Cir. 1972). "Handwriting and voice exemplars of a defendant can be obtained without constituting an invasion of privacy."

State vs. Ostrowski, 282 N.E.2d 359 (Ohio 1972). "A handwriting exemplar, required for comparison purposes, is outside the scope of the Fifth Amendment privilege against self-incrimination. It is not required that *Miranda* warnings be given prior to obtaining the exemplars. The standards may contain the same words as those contained in a questioned writing."

It is suggested that you contact the prosecuting agency in your area and follow his advice as to the collection of specimens and their admissibility as evidence.

I. Collected Exemplars

Possible sources of handwriting, handprinting or typewriter exemplars are:

- Applications for employment
- Bail Bond applications
- Bank account, cancelled checks, signature cards
- Civil Service applications and examinations
- Court records
- Credit applications, loan applications
- Drivers license and applications
- Employee records
- Family members or neighbors
- Insurance applications
- Lease or rental agreements
- Military records
- Registered letter receipts
- School papers
- Tax exemption applications
- Utility service records; gas, water, electricity, etc.
- Veterans Administration
- Voters registration

Some of these exemplars may not be proper for admission as court evidence but they may assist the investigator as a lead in his case.

REMEMBER: The examination results generally depend on the quality and quantity of the material submitted for examination.

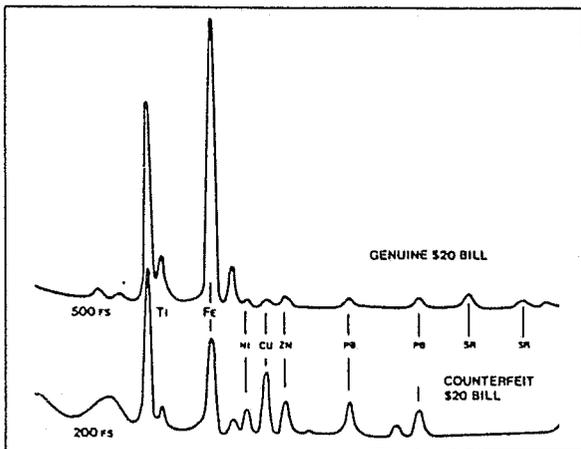
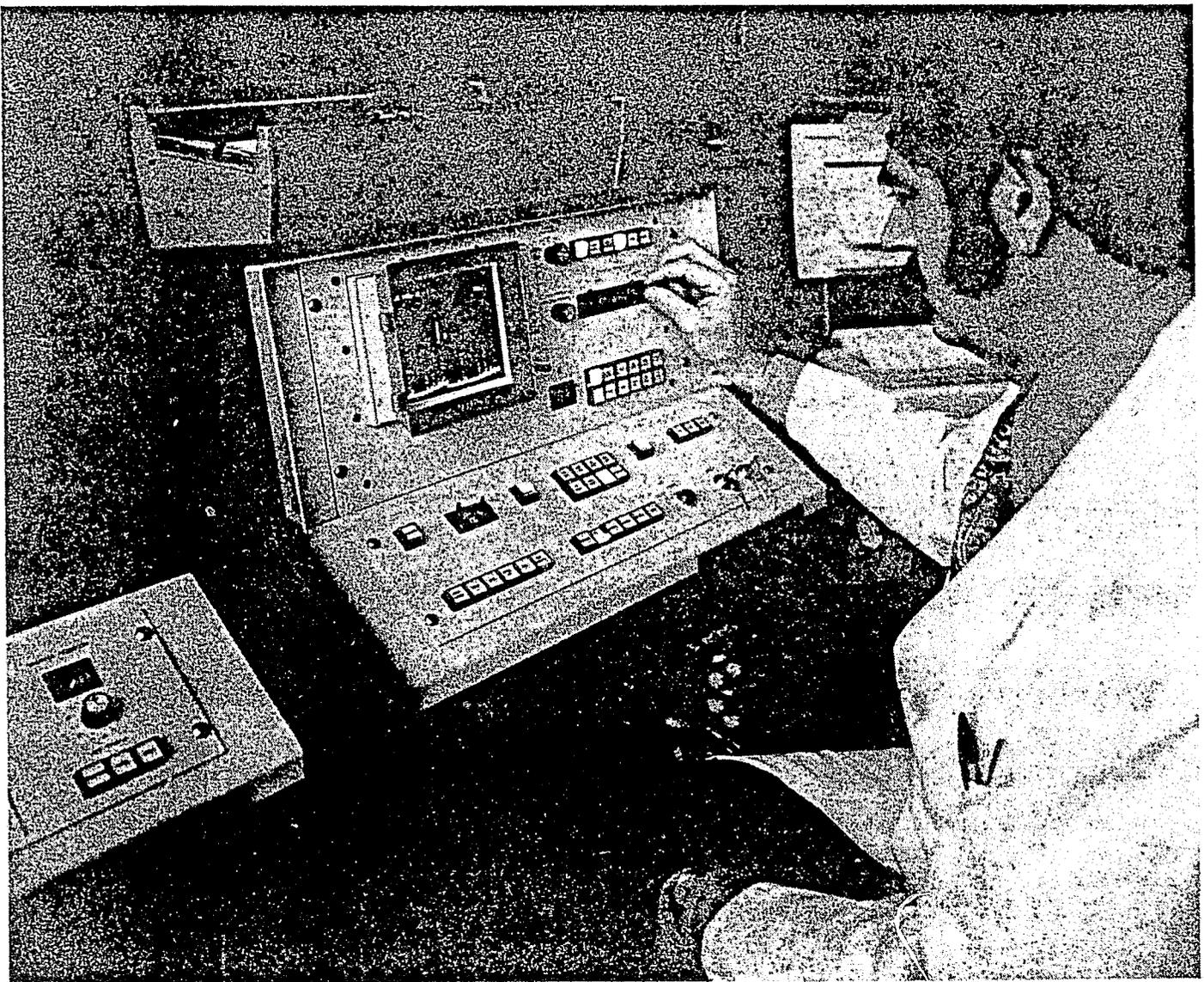
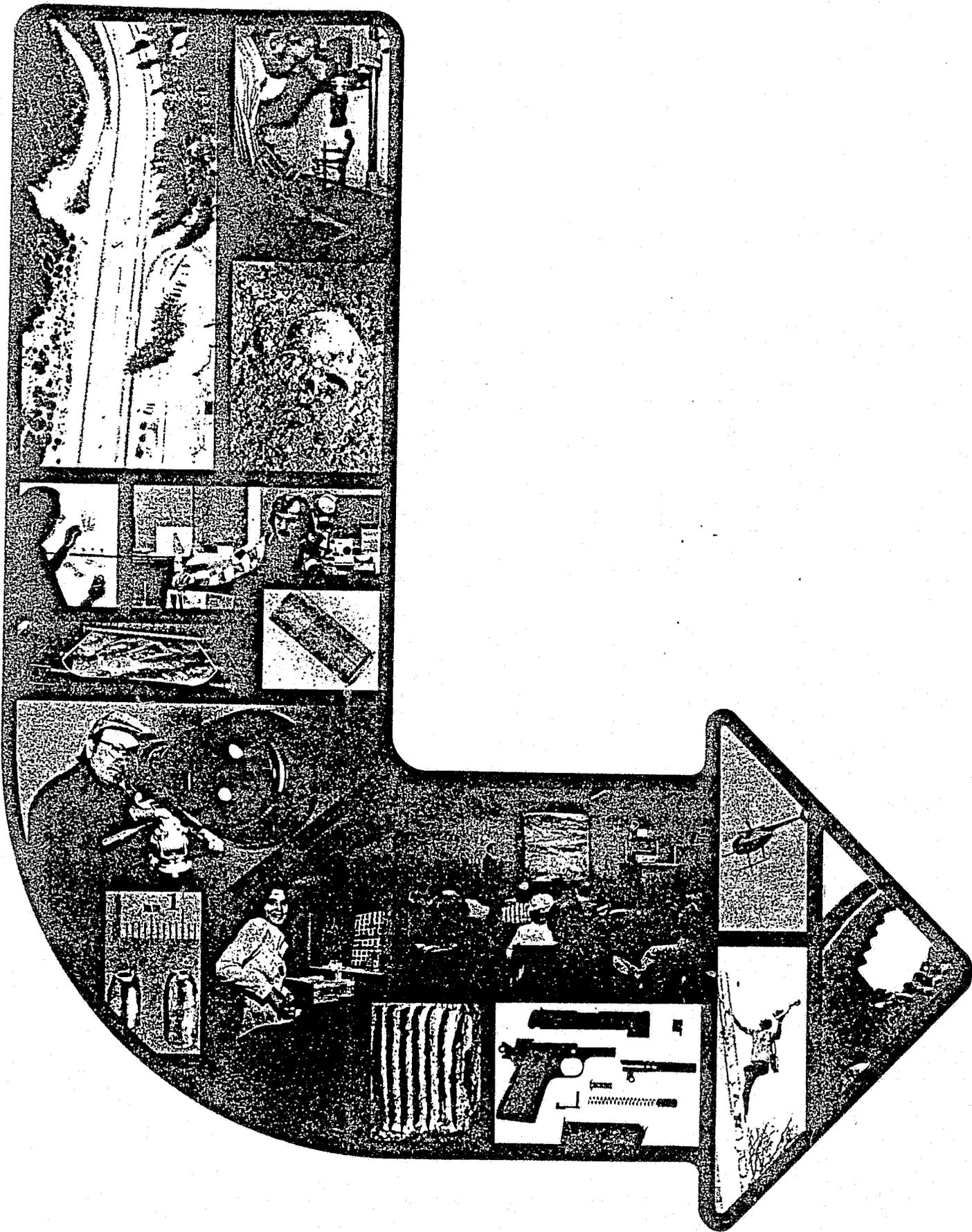


Photo 49 The Energy Dispersive X-ray (EDX) spectrometer is used to analyze inorganic compositions of many substances. While normally used on paint chips, glass, soil, bullets, one of the latest applications is questioned documents studies. Chemical differences in genuine and counterfeit notes are easily seen by nondestructive testing. EDX is located in Fresno, Riverside and Sacramento Regional Laboratories.





X. FORENSIC PHOTOGRAPHY SECTION

Forensic evidence photography, along with crime scene documentation and recording, is recognized today as indispensable to law enforcement.

Through use of forensic photography, vital information is graphically communicated daily in the courts and throughout the Criminal Justice System.

A. Services

The Forensic Photography Section provides the following services to law enforcement agencies in the state.

1. Crime scene documentation and recording.
2. Physical evidence photography.
3. Infrared, ultra-violet and infrared luminescent photographic examination.
4. Trace evidence photography.
5. Aerial photography—crime scene overviews.
6. Image enhancement techniques.
7. Specialized identification and surveillance photography.
8. Court testimony.
9. Training in crime scene photography and other forensic photographic techniques.
10. Consultation regarding forensic photographic problems.

B. Availability

Photographic assistance may be requested during normal weekday work hours by telephoning the Photography Section in Sacramento at 916-445-3526. During off hours, weekends and holidays, requests for service should be placed with the Command Center at 916-445-9240. In addition, requests may be placed through the nearest regional criminalistics laboratory (see appendix).

C. Evidence to be Photographed

When forensic photography of evidence is required

in conjunction with analysis by a criminalistics laboratory, Latent Print Section or Questioned Documents Section, the items should be clearly marked for photographic service. Because normal photographic examinations including infrared and ultraviolet techniques are totally non-destructive, this procedure should be conducted prior to any other investigative services being performed.

The photographic request should also be noted on "Physical Examination" request form ISB4 submitted with the evidence.

Evidence requiring photography only, may be personally delivered to the Section at 3301 C Street, Sacramento or mailed to the Forensic Photography Section, Investigative Services Branch, P.O. Box 13337, Sacramento, Calif. 95813. Examples would be:

1. Exposed color or black and white films found in cameras at crime scenes. Exposed films sometimes contain valuable investigative leads.
2. Recovered Polaroid paper negatives from crime scenes with images still visible. By subjecting these negatives to specialized "image enhancement" techniques, the Forensic Photography Section can develop and preserve valuable investigative information.
3. Motion picture film or slides containing intelligence, suspect or investigative information.

D. Restrictions

The Photography Section does not normally develop film or prints for routine requirements of law enforcement agencies. However, if local outside or vendor processing would compromise the evidence or investigation, arrangements can be made for film processing and printing services. Other special requirements should be discussed by telephone with the Forensic Photography Section prior to sending any film to Sacramento.

XI. POLYGRAPH SECTION

POLYGRAPH EXAMINATIONS

Polygraph examinations are conducted by polygraph examiners for various activities throughout the State of California. No shipment of evidence is involved since the graphs produced during the examination are retained in the custody of the polygraph examiner and returned to this headquarters where custody is maintained. Reports containing the opinions rendered are forwarded by this office to the requesting agencies. However, no special mailing is required since no items of physical evidence (polygraphs) are forwarded with the reports.

BASIC INFORMATION REGARDING THE POLYGRAPH

A. Introduction

1. There is no mechanical or electrical device known to man that actually detects lies or truth. The instrument popularly known as "lie detector," "lie box," or, as we refer to it, the "polygraph," is a scientific diagnostic instrument on much the same order as the electrocardiograph, electroencephalograph, or the x-ray. Through the proper use of the polygraph, a competent polygraph examiner can diagnose truth or deception.

2. Stipulated Polygraph Examination

The results of a polygraph examination are admissible as evidence in court on stipulation only. A stipulation is a written agreement signed by the District Attorney, the defendant, and the defense attorney before the defendant submits to a polygraph examination. The stipulation will state that the defendant will voluntarily submit to a polygraph examination to be administered by a particular polygraph examiner or agency. If the tests results are conclusive, the examiner's opinion as to the truth or deception, and the charts, will be admitted as evidence in court. If the results are inconclusive, no testimony by the examiner will be admitted. Even though the examiner is known as an expert in his field, he must still prove his expertise each time he testifies in court.

3. The polygraph instrument is (basically) composed of four components:

- a. The pneumograph component—records changes in respiration.
- b. The galvanograph component—records changes in the electrical resistance on the surface of the skin.

- c. The cardiosphygmograph component—records changes in blood pressure and pulse rate.
 - d. The kymograph components—move the chart paper at a timed rate of speed, under the pens of the other three components.
4. The Theory of the Polygraph Examination
- a. Based on emotion of fear,
 - b. Fear of detection by an untruthful subject will cause physiological changes to occur in the subject's body at point of deception,
 - c. Physiological changes can be diagnosed by a trained, competent examiner.
 - d. The subject must have something to gain or lose by submitting to the examination.

B. Basic Uses of the Polygraph

1. The polygraph is an excellent *aid* and a valuable tool, if properly utilized during the conduct of an investigation.

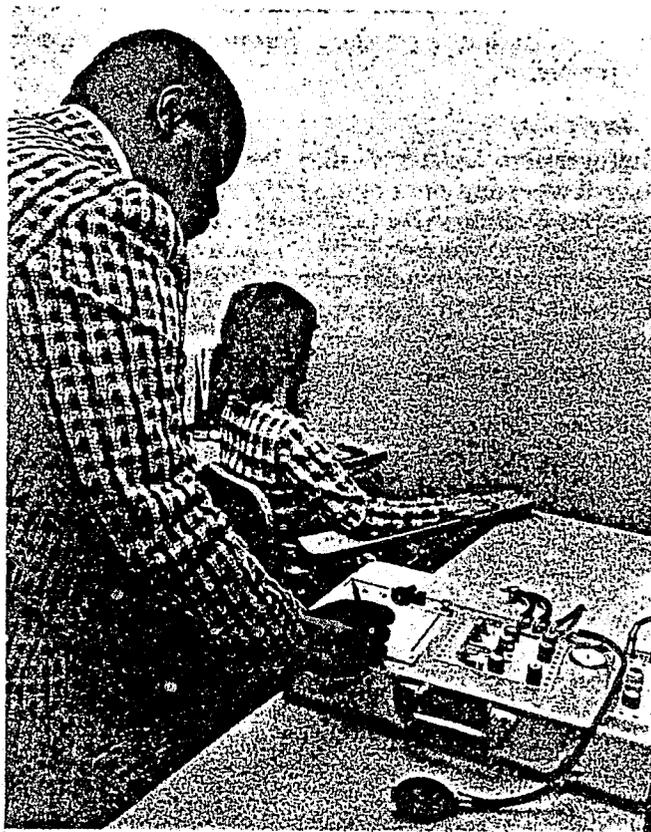


Photo 51 Subject being tested with the polygraph.

PHYSICAL EVIDENCE MANUAL

2. The polygraph, however, will *never* be able to take the place of *good, thorough* investigative methods.
3. The final results of a polygraph examination will be based, in great measure, upon the thoroughness of the investigation *prior* to having a subject take the examination.
4. In criminal investigations, examinations will be conducted upon:
 - a. Suspects
 - b. Victims
 - c. Witnesses
 - d. Informants

C. Factors That May Prohibit Polygraph Examinations:

1. A polygraph examination should *not* be conducted on *any subject who has been physically abused*, or any person that the examiner feels will be an unfit subject, nor any subject who has been questioned extensively, immediately prior to the time for testing.
2. Only those who voluntarily agree and will *sign a statement of consent* can be examined.
3. Juvenile Subjects.
 - a. Juvenile subjects under the age of 14 years are very difficult subjects to examine due to a lack of maturity, both physical and mental. Many times conclusive results cannot be obtained by the use of the polygraph because of these factors.
 - b. Consent forms for juveniles *must* be signed by either the parent or guardian prior to the examination.
4. Physical and/or Psychological Factors.
 - a. The investigator must keep in mind that there are several other factors, especially of a physical or psychological nature, that sometimes preclude the use of the polygraph on a subject.

Questionable subjects are:

 - (1) Females during menstrual period.
 - (2) Females that are more than 90 days in pregnancy.
 - (3) Subjects with amputations, affecting the placement of instruments on the subject's person.
 - (4) Subjects with paralysis.
 - (5) Recent surgery or major injury or illness. The human body usually requires at least six months to fully recover.
 - (6) Physical disabilities—skull or spine injuries, high or low blood pressure, and cardiac (heart) trouble.
 - (7) Certain types of drugs and medication will preclude the use of the polygraph.
 - (8) Emotional instability.
 - (9) A subject who has not had sufficient nourishment.

- (10) Subject suffering from a severe cold or respiratory disorder.
- (11) Subjects with low mental ability—idiots, imbeciles, and morons. However, these should not be confused with lack of academic education.
- (12) Mental illness—either pathological or psychological.

INVESTIGATOR'S PROCEDURE FOR PREPARING A SUBJECT FOR EXAMINATION:

A. Preliminary Arrangements

1. Making appointments for polygraph examinations.
 - a. A request for a polygraph examination by any law enforcement agency may be made either by phone or written request.

PHONE: (916) 322-2138
 - b. Upon request, the Polygraph Section will advise the requesting party of the first open time, and a definite appointment will be made.
2. Aid to Interrogation.
 - a. The investigator should keep in mind from the very inception of the investigation that he may find it necessary to request the aid of the polygraph.
 - b. The investigator should withhold *KEY INFORMATION* from the *SUBJECT AND* the *PRESS*.
 - (1) Reference to the press does not mean that the press should not be informed of the circumstances of a crime, but that certain "catch phrases" or "peculiar acts," etc., on the part of the suspect could be withheld without materially affecting a press release.
 - c. *NEVER USE THE POLYGRAPH EXAMINATION AS A BLUFF*. Do not ask your subject to submit merely to "bluff" him, and then when he agrees, forget it. This does not mean he is innocent at all. Do not ask him to submit unless you mean for him to take the examination.
 - d. Polygraph should not be used just as a last resort.
3. Necessary case records.
 - a. Records of the case should include:
 - (1) Crime reports of suspected offense(s).
 - (2) Investigation reports to date.
 - (3) Background information of the suspect to be examined.
 - (4) Brief resume of the reason for the examination.
 - (5) Brief resume of statements or denials made by the subject.
4. Interrogation prior to time of examination.

PHYSICAL EVIDENCE MANUAL

- a. Extensive interrogation of the subject within four hours prior to the examination should be avoided so that an accurate determination of truthfulness or untruthfulness of the subject can be accomplished.
 - b. The subject may be questioned *briefly* prior to the examination, but only to determine opportunity to commit the crime, and motive or desire.
 - c. This should *not* be misinterpreted as meaning that the investigator should not interrogate during the investigation, but *only* applies to that period of time *JUST PRIOR* to the examination. Prolonged interrogation of a person produces an exhausted or antagonistic subject who may then not be a fit subject for the examination.
 - d. The chances of a successful conclusion to an investigation are great when the suspect is made available for a polygraph examination before the final stage of the investigation.
5. Physical condition of subject prior to examination.
- a. It is desirable that the subject have a normal amount of food and sleep during the 24-hour period preceding the polygraph appointment.
 - b. A person suffering from the influence of alcohol, sedatives, opiates, physical pain, severe cold or respiratory disorder is not ordinarily considered to be in a fit condition for a polygraph examination.
- B. Suggested information to be withheld from the subject.
1. Method of polygraph examination
 - a. The subject of a polygraph examination should *NOT* be advised of the method in which the examination is to be conducted.
 - b. The subject should only be told that he or she will suffer no discomfort, will not be subjected to injections of any type, and that the entire process will be explained to him or her by the examiner prior to being examined.
 2. Details of crime to be withheld.
 - a. The investigating officer, field as well as detective, should avoid disclosure of any details or facts established during the investigation to the subject or suspect.
 - b. Facts concerning the crime, which could only be known to the perpetrators should *never* be told the suspect, press, or the general public.
 - (1) If this precaution is disregarded, the probability of a conclusive polygraph examination may be nullified as a subject then has been furnished with a reason for knowing such important information.
 - (a) He/she could then state they were aware of certain facts because they had been told about same by friends, the detective, or had read same.
3. Examples of details which *should not, whenever possible*, be divulged are as follows:
 - a. Method of entry
 - (1) Tools used to effect entry
 - (2) Point of entry
 - (3) Extent of damage at point entry
 - (4) Whether or not entry was made by use of key
 - b. Property taken
 - (1) Specific amount taken
 - (2) Denominations of currency taken
 - (3) Unusual articles taken
 - (4) Description of articles taken
 - c. Weapon or force used to commit crime—specific
 - (1) Club
 - (2) Gun
 - (3) Knife
 - (4) Poison
 - (5) Number and location of wounds and bruises
 - d. Evidence left at the scene of the crime by suspects—tools, weapons, articles of clothing, etc.
 - e. Unusual acts of suspect before, during, or after the commission of the crime.
 - (1) Conversation or commands
 - (2) Peculiar habits, actions or characteristics of the suspects.
 - f. Means of exit from the scene
 - (1) If by vehicle, anything unusual about same, such as dents, missing portions, loud muffler, damage, etc.
 - (2) If on foot, direction taken from scene if noted.
 - g. Location from which property was taken
 - (1) Where safe or cash box was located in the building.
 - (2) Type of container from which money or articles were taken, such as green metal cash box, cigar box, laundry bag, paper sack, etc.
 - h. Homicide weapons used
 - (1) Make and type of gun such as .38 caliber, Smith and Wesson, 4" chrome plated with plastic grips, if it is found at crime scene.
 - (2) Weapon believed to have caused death.
 - (3) Detailed description of knives and other weapons.

PHYSICAL EVIDENCE MANUAL

C. Administering the Examination

1. The investigator(s) who actually participated in the investigation should be present at the time of the examination to turn the subject over to the examiner and should remain available to the examiner in order to discuss any pertinent information which may result from the testing sequences.
 - a. It is necessary for the investigator(s) to be present as they are most familiar with the facts and case information.
2. The polygraph examination is a time-consuming process and the investigator(s) and subject should expect the examination to take a minimum of two hours to complete.
3. The examiner, at any stage of the examination, will advise the investigator(s) of the desire of a subject who may wish to make admissions of participation in a crime, and will then turn the subject over to the investigator(s) for further investigation.

D. Summary

1. Polygraph examinations are *NOT* a substitute for thorough preliminary investigation.
2. Polygraph examinations should be regarded only as a supplement to a thorough and complete investigation.
3. *NEVER* withhold any pertinent information on either the crime or the subject from the polygraph examiner.
4. **THE EFFECTIVENESS OF THE POLYGRAPH EXAMINATION IS DEPENDENT UPON THE INVESTIGATOR(S) AND THE POLYGRAPH EXAMINER WORKING TOGETHER**

NOTE: IF AT ANY TIME YOU HAVE ANY QUESTIONS RELATIVE TO THE POLYGRAPH, EXAMINATION PROCEDURE, SCHEDULING OF EXAMINATIONS, OR THE ADMINISTERING OF EXAMINATIONS, PLEASE FEEL FREE TO CALL. WE PRESENTLY HAVE AVAILABLE FOUR QUALIFIED EXAMINERS TO ASSIST YOU IN POLYGRAPH MATTERS.

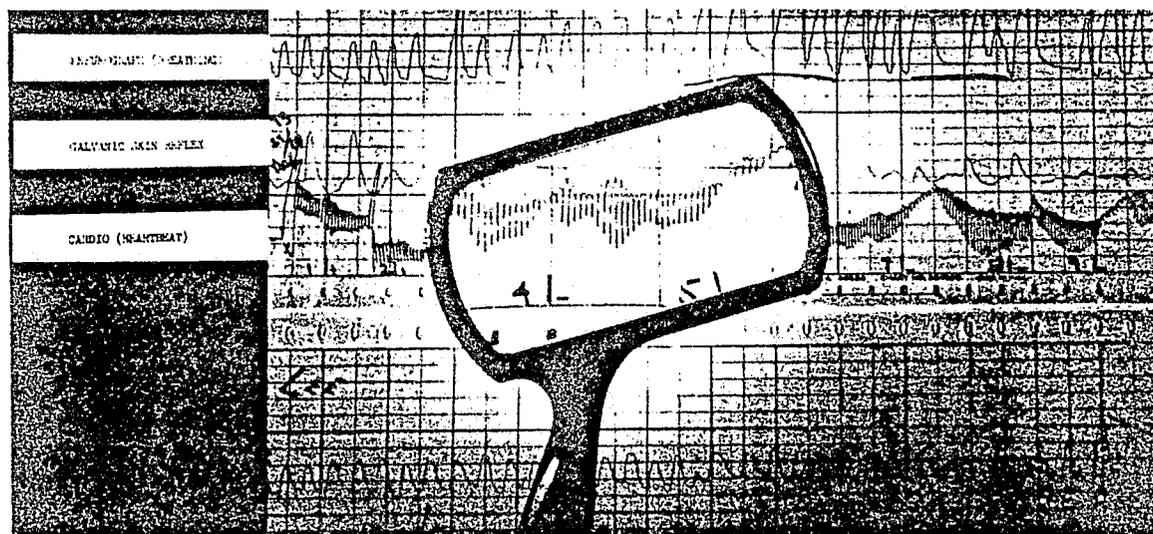


Photo 52 The three tracings of physiological responses of a subject.

XII. CRIME SCENE INVESTIGATION

Personnel of ISB regional laboratories are available to requesting agencies to provide assistance at the scene of a major crime. Generally, homicides or other serious offenses which are beyond the scope of the local agencies' trained evidence technician fall in this category. Participation of ISB personnel in a field investigation is under the general guidelines indicated under Section III, BRANCH SERVICES AND FUNCTIONS, page 7.

Participation by ISB personnel to assist in a field investigation generally encompasses three levels of activity:

1. Advisory capacity only where the investigating officer is unsure of the value of potential evidence and would like ISB personnel present to advise as the usefulness of this evidence. In this case, agency personnel actually process the scene and collect the evidence for submission to the laboratory or special sections.
2. Scene processing where the investigating agency does not have qualified personnel who can process the crime scene, and would like ISB to provide assistance in investigating and proper identification and collection of evidence. In this case, ISB personnel actually process the scene and collect the evidence.
3. Reconstruction, wherein laboratory personnel are available to aid the requesting agency in reconstructing the activities at a crime scene before and after the offense.

Agencies requesting assistance on field investigations should provide ISB personnel with background information before arrival of the processing team (e.g., Has the scene been isolated? Is the suspect in custody? Have any live victims been given hospital transfusions?). Also at the time of the request, the chief investigating officer should provide a general description of the circumstances to ISB personnel and indicate whether or not the agency will require a criminalist, an ISB photographer, latent print examiner, Bureau of Investigation Special Agent, or other services. In some circumstances, the actual crime scene team processing is not warranted and problems can sometimes be answered on the phone through consultation with the criminalist or other technical specialist.

It should be understood that the responsibility of resolving legal proprieties such as search warrants rests with the requesting agencies. Such matters should be resolved before crime scene processing. When the ISB criminalist and other technical specialist arrive at the scene, the chief investigating officer should identify himself and agree with ISB personnel as to which levels of participation (described above) will be required. At this time, the chief investigating officer and the criminalist or other scene processing members should determine how the scene is to be processed, who will do sketching, who will make distance measurements, who will enter the crime scene first (latent print examiner, photographer, etc.)



Photo 53 Criminalist recovering trace evidence from deeply buried homicide victims prior to removal of remains.

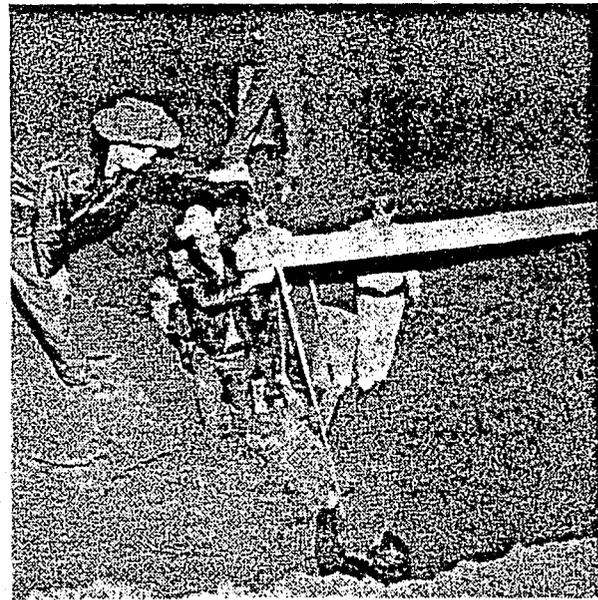


Photo 54 Criminalist and agency personnel decide on methods of measurement and use of available reference points appropriate to each crime scene.

PHYSICAL EVIDENCE MANUAL

If a post-mortem examination is to be performed, the ISB criminalist generally attends for the purpose solely of collecting physical evidence associated with the deceased (blood sample, clothing, bullet extracted from wound).

In shooting cases, with either deceased or live victims, it may become desirable to process the subject's hands for microscopic evidence, gunshot residue, or metal traces from a handgun. If this becomes necessary, refer to the Physical Evidence Bulletins on either Trace Metal Detection Technique or Gunshot Residue Collection, PEB 14/77 and 15/77 respectively.

Other specialized types of evidence associated with a field investigation may require special processing. This could include footprints and tire tracks, see PEB

23/77, documentation and interpretation of blood splatters (confer with criminalist), volatile or flammable substances (see PEB 10/77) and stain or trace evidence on valuable or massive objects (confer with criminalist).

ISB personnel will not make public statements concerning physical evidence. Any statements solicited by non-law enforcement personnel, particularly the press, are to be discouraged. ISB criminalists and technical personnel are instructed not to speak to the press unless the presiding district attorney or chief law enforcement officer in charge of the crime scene asks that the ISB representative give details. At this time, the criminalist or other technicians will only specify details and will refrain from theorizing or reconstructing the events that may or may not have occurred based on the observations he makes.

XIII. INFORMATION FOR DISTRICT ATTORNEY, OTHER PROSECUTORS AND PUBLIC DEFENDERS

A. Expert Testimony

1. In addition to conducting examinations and comparisons of various types of physical evidence, criminalists and other experts of the ISB are available to present expert testimony concerning their findings before the courts. In order that the ISB be of maximum assistance, it is requested that attempts be made to follow the procedures listed below:
 - a. Notify the analyst, as much in advance of the trial date as possible, so that time will be available to prepare any necessary photographic or other exhibits.
 - b. Due to the number of cases being handled by each employee, conflicts in court appearance dates may frequently occur. When sufficient advance notice is given of scheduled trials many of these conflicts can be satisfactorily resolved. Considerable time is also necessary to travel to and from courts which are not close to the analyst's office. Occasionally, a single trip will permit the analyst to make more than one court appearance when sufficient advance notice is given.
 - c. The individual who signs the report submitted is the analyst responsible for the evidence examinations. Notices to appear in court should be sent to this person. Other employees normally have not examined or marked the evidence submitted and therefore cannot serve as effective witnesses.
 - d. Employees may be requested to appear as witnesses by having a subpoena served on them, but normally this is not necessary and will delay notification more than other methods. The receipt of a letter, or teletype message will be acknowledged and treated as an official notice to appear in the same manner as a subpoena.
 - e. In all cases it is requested that, in addition to the notice to appear in court, information be furnished as to the date and approximate hour when the witness will be needed. While the prosecutor cannot always predict in advance the exact time that a specific witness will be called, it is often possible in lengthy trials to at least roughly predict the time required to obtain a jury and examine witnesses whose testimony is necessary prior to the appearance of the expert witness. The number of court appearances being made each week by the experts of the Branch makes it difficult for them to appear in all cases where they are needed, since a

considerable amount of time must be spent in traveling to distant courts. Time used in waiting outside of court rooms while juries are being selected or other witnesses are being examined has sometimes amounted to many days and caused other prosecutors either to ask for continuances in their cases or to forego use of the expert witness' testimony which was of importance in their cases.

- f. The appropriate laboratory or section should also be notified immediately of any change in trial or appearance dates. On many occasions, witnesses have appeared, as requested, to testify on specific cases only to find that the defendant has changed his plea to guilty or the case was continued. While a change of plea may be made at the last minute, there have been many instances where this was known in advance, but the Branch was not advised and employees have needlessly traveled hundreds of miles.
- g. In contacting the Branch concerning a specific case, particularly when done by telephone, advise us of the case number appearing on the report, if possible. This permits the laboratory to locate the filed report or other records without unnecessary delay.
- h. Before testimony is presented, *the attorney should arrange to confer with the criminalist or other expert* concerning his qualifications and the testimony to be presented. This is essential in order to obtain maximum effectiveness from the testimony.
- i. No witness fees, travel expenses, or other charges are made for expert testimony or any other service furnished by this Branch in criminal cases within the State of California.

B. Other Special Aids for Prosecutors and Public Defenders

1. The criminalists, as well as other experts of the Branch, are available to render other special aid to prosecutors and public defenders in criminal cases. This may consist of furnishing assistance in preparing scientific phases of certain cases for trial, evaluating scientific aspects of such cases, or actually examining evidence. Services are provided for public defenders under contract as per conditions of Section 1105.5 of the Penal Code. Inquiries should be directed to the Branch by telephone or at the address cited in Appendix B.

PHYSICAL EVIDENCE MANUAL

2. Assistance is also rendered in interpreting and evaluating testimony presented by experts called by the defense.
3. Requests for such assistance, when not made in person, should always include information con-

cerning the basic problem involved or testimony which has already been given or is expected. This is usually necessary so that any research or other studies can be made prior to the personal consultation of the expert with the attorney.

APPENDIX A

PHYSICAL EVIDENCE BULLETINS

- 1/77 Urine as a Sample for Alcohol Determination
- 2/77 Uniform Standards for Withdrawal, Handling, and Preservation of Blood Samples for Forensic Alcohol Analysis
- 3/77 Automobile Lights
- 4/77 Sample Collection of Blood for Blood Typing
- 5/77 Collection of Paint Fragments
- 6/77 Collection of Hair Samples
- 7/77 Guidelines for Physical Evidence in Sexual Assault Investigations
- 8/77 Drug Analysis in Driving Under the Influence Cases
- 9/77 Collection of Glass Fragments
- 10/77 Collection of Volatile Flammables
- 11/77 Collection of Fiber Evidence
- 12/77 Firearms Evidence Collection Procedures
- 13/77 Collection of Soil Samples
- 14/77 Trace Metal Detection Technique (TMDT)
- 15/77 Gunshot Residue Collection
- LP 16/77 Submission of Inked Fingerprints of Identified Subjects
- LP 17/77 Latent Print Section
- QD 19/77 Submission of Evidence to the Questioned Documents Section
- QD 20/77 Exemplars of Mechanical Reproductions, Serrations and Tears for Questioned Document Examination
- QD 21/77 Court Decisions Regarding Exemplar Material for Questioned Documents
- 23/77 Preservation of Shoe Tracks and Tire Tracks
- PL 24/77 Polygraph Examination Procedure
- 25/77 Controlled Substances
- 26/77 Clandestine Laboratories
Physical Evidence Chart—Collection and Preservation
Flyer on Purchase of Physical Evidence Manual
Map-Service Zones for Statewide Criminalistics System Laboratories

These may be requested through the laboratories and appropriate special sections of the branch. Proper addresses and telephone numbers appear in Appendix B.

APPENDIX B
DEPARTMENT OF JUSTICE, DIVISION OF LAW ENFORCEMENT
INVESTIGATION AND ENFORCEMENT BRANCH

ASSISTANT DIRECTOR
(916) 739-5674
4949 Broadway
Sacramento, CA 95820

BUREAU OF FORENSIC SERVICES

CHIEF
(916) 739-5484

SPECIAL SECTIONS

Manager (916) 739-5484

Latent Print Section
Supervisor (916) 739-5137

Questioned Document Section
Supervisor (916) 739-5139

Polygraph Section
Supervisor (916) 739-5135

Audio-Visual Section
Supervisor (916) 739-5138

CRIMINALISTICS LABORATORIES

North Area
Manager (916) 739-5484

Sacramento
Criminalistics Laboratory
4949 Broadway
Sacramento, CA 95820
(916) 739-5136
ATSS 8-497-5136

Redding
Criminalistics Laboratory
1515 No. Old Oregon Trail
Redding, CA 96001
1-241-3870
ATSS 8-442-6514

Santa Rosa
Criminalistics Laboratory
7505 Sonoma Highway
Santa Rosa, CA 95405
(707) 576-2415
ATSS 8-590-2415

San Rafael
Criminalistics Laboratory
Hall of Justice, Civic Center
San Rafael, CA 94903
(415) 472-4425

Chico
Criminalistics Laboratory
562 Manzanita Avenue, Suite 10
Chico, CA 95926
1-895-5024
ATSS 8-459-5024

Eureka
Criminalistics Laboratory
College of the Redwoods, Bldg. T-40
Eureka, CA 95501
(707) 733-5726

Central Area
Manager (209) 294-2982

Fresno
Criminalistics Laboratory
6014 North Cedar
Fresno, CA 93710
(209) 294-2982

Salinas
Criminalistics Laboratory
745 Airport Blvd.
Salinas, CA 93901
(408) 443-3188
ATSS 8-588-3188

Modesto
Criminalistics Laboratory
2213 Blue Gum Avenue
Modesto, CA 95351
(209) 576-6215
ATSS 8-462-6215

Stockton
Criminalistics Laboratory
1001 W. Mathews Road
French Camp, CA 95231
(209) 948-7554

South Area
Manager (714) 781-4170

Riverside
Criminalistics Laboratory
P.O. Box 3679, 1500 Castellano Rd.
Riverside, CA 92509
(714) 781-4170
ATSS 8-632-4170

Santa Barbara
Criminalistics Laboratory
820 Frances Botello Rd.
Goleta, CA 93017
(805) 964-8741

San Luis Obispo
Criminalistics Laboratory
P.O. Box 1484, Kansas Avenue
San Luis Obispo, CA 93401
(805) 544-8310

Technical Support Unit
Manager (916) 739-5484
4949 Broadway
Sacramento, CA 95820

Toxicology Unit
Chief Toxicologist
(916) 739-5128

Instrument Repair Unit
Supervisor
(916) 739-5189

ATTACHMENT B

Wisconsin Department of Justice

Statutes for Crime Laboratories



Wisconsin Department of Justice
Division of Law Enforcement Services

CRIME LABORATORY BUREAU
Daniel J. Dowd, Director

4706 University Avenue
P.O. Box 5708
Madison, Wisconsin 53705
(608) 266-2031

REGIONAL LABORATORY
15725 West Ryerson Road
New Berlin, Wisconsin 53151
(414) 786-7700

Bronson C. La Follette
Attorney General

Howard G. Bjorklund
Division Administrator

March 11, 1983

Mr. Leonard Steinberg
House of Representatives
Pouch Y
Juneau, Alaska 99811

Dear Mr. Steinberg:

Per our telephone conversation on March 11, 1983.

Sincerely,

A handwritten signature in cursive script, appearing to read "Daniel J. Dowd".

Daniel J. Dowd
Director
Crime Laboratory Bureau

DJD:fh

Enclosure

\$25 nor more than \$200 for each neglect or violation.

(14) The state fire marshal, any deputy fire marshal or fire chief may require an insurer, including the state acting under ch. 619, to furnish any information in its possession relating to a fire loss involving property with respect to which a policy of insurance issued or serviced by the insurer may apply. Any insurer, including the state, may furnish to the state fire marshal, any deputy fire marshal or fire chief information in its possession relating to a fire loss to which insurance issued by it may apply. In the absence of fraud or malice, no insurer furnishing information under this subsection, state fire marshal, deputy fire marshal or fire chief, and no person acting on behalf of the insurer, state fire marshal, deputy fire marshal or fire chief, shall be liable in any civil or criminal action on account of any statement made, material furnished or action taken in regard thereto. Information furnished by an insurer under this subsection shall be held in confidence by the state fire marshal, deputy fire marshal or fire chief and all subordinates until release or publication is required pursuant to a civil or criminal proceeding. Information obtained by the state fire marshal, any deputy fire marshal or fire chief during their investigations of fires determined to be the result of arson may be available to the insurer of the property involved.

History: 1973 c. 333; 1975 c. 224; 1977 c. 260, 341; 1979 c. 133; 1981 c. 318.

State fire marshal must establish proper discretionary reasons for exercising privilege of secrecy under (8). *Black v. General Electric Co.* 89 W (2d) 195, 278 NW (2d) 224 (Ci. App. 1979).

See note to art. I, sec. 11, citing *State v. Monosso*, 103 W (2d) 368, 308 NW (2d) 891 (Ci. App. 1981).

Arson investigations under (9) and (10) are subject to search warrant requirements set forth in *Michigan v. Tyler*, 436 US 499 (1978). Consent to search discussed. 68 Atty. Gen. 225.

185.60 Law enforcement. The division of criminal investigation is authorized to enforce ss. 944.30, 944.31, 944.33, 944.34, 945.02 (2), 945.03 and 945.04 and shall be invested with the powers conferred by law upon sheriffs and municipal police officers in the performance of such duties. Nothing herein shall deprive or relieve sheriffs, constables and other local police officers of the power and duty to enforce said sections, and such officers shall likewise enforce said sections.

History: 1975 c. 39.

185.70 Investigation of state-wide crime.

(1) The division of criminal investigation shall:

(a) Investigate crime which is state-wide in nature, importance or influence;

(b) Enforce chs. 161 and 945 and ss. 940.20 (3), 941.25 to 941.27, 943.01 (2) (c), 943.27,

943.28, 943.30, 944.30, 944.31, 944.32, 944.33, 944.34, 946.65 and 947.02 (3) and (4);

(d) Enforce and administer s. 165.55.

(e) Investigate violations of ch. 163 that are statewide in nature, importance or influence.

(2) The attorney general shall appoint, under the classified service, investigative personnel to achieve the purposes set out in sub. (1) who shall have the powers of a peace officer. As many as are deemed necessary of the investigators so appointed shall be trained in drugs and narcotics law enforcement, or shall receive such training within one year of their appointment, and they shall assist, when appropriate, local law enforcement agencies to help them meet their responsibilities in this area.

(3) It is the intention of this section to give the attorney general responsibility for devising programs to control crime state-wide in nature, importance or influence, drugs and narcotics abuse, commercial gambling, prostitution, and arson. Nothing herein shall deprive or relieve local peace officers of the power and duty to enforce those provisions enumerated in sub. (1).

(4) Local district attorneys, sheriffs and chiefs of police shall cooperate and assist the personnel of the division in the performance of their duties.

History: 1971 c. 40, 211, 307; 1973 c. 156; 1975 c. 39; 1977 c. 173 s. 168; 1977 c. 215, 260; 1977 c. 272 s. 98.

SUBCHAPTER III

DIVISION OF LAW ENFORCEMENT SERVICES

185.75 Crime laboratory. (1) Unless the context clearly requires otherwise:

(a) "Laboratory" means the crime laboratory.

(b) "Administrator" means the administrator of the division of law enforcement services.

(c) "Employee" means any person in the service of the laboratory other than the administrator.

(2) The crime laboratory shall be located in the city of Madison. The personnel of the laboratory shall consist of such employes as are authorized under s. 20.922.

(3) (a) The purpose of the laboratory is to establish, maintain and operate a crime laboratory to provide technical assistance to local law enforcement officers in the various fields of scientific investigation in the aid of law enforcement. Without limitation because of enumeration the laboratory shall maintain services and employ the necessary specialists, technical and scientific employes for the recognition and proper preservation, marking and scientific analysis of evidence material in the investigation

and prosecute firearms identification of comparative identification of fingerprints, photographs.

(b) The division of peace officers or to serve shall not be or election shall not conduct excoroner, chief of police, state prison, head of any tions but limited to enforcement been vested

(c) Upon collaborate criminal forensic science the scene of equip a mob

(d) The court as exp

(e) The laboratory s potential ch:

(f) The provided in department, state is a p requested to

(4) The conform to the attorney

History: 15
An evaluation
Indriksons, 197

185.78 Intities. (1) services shall information In furthera bulletins by tem. The di and coopera of informati

and prosecution of crimes in such fields as firearms identification, the comparison and identification of toolmarks, chemistry, identification of questioned documents, metallurgy, comparative microscopy, instrumental detection of deception, the identification of fingerprints, toxicology, serology and forensic photography.

(b) The administrator and employes of the division of law enforcement services are not peace officers and shall have no power of arrest or to serve or execute criminal process. They shall not be appointed as deputy sheriffs and shall not be given police powers by appointment or election to any office. Laboratory employes shall not undertake investigation of criminal conduct except upon the request of a sheriff, coroner, medical examiner, district attorney, chief of police, warden or superintendent of any state prison, attorney general or governor. The head of any state agency may request investigations but in such cases the services shall be limited to the field of health, welfare and law enforcement responsibility which has by statute been vested in the particular state agency.

(c) Upon such request the laboratory shall collaborate fully in the complete investigation of criminal conduct within its competence in the forensic sciences including field investigation at the scene of the crime and for this purpose may equip a mobile unit or units.

(d) The services of the laboratory available to such officer shall include appearances in court as expert witnesses.

(e) The administrator may decline to provide laboratory service in any case not involving a potential charge of felony.

(f) The services of the laboratory may be provided in civil cases in which the state or any department, bureau, agency or officer of the state is a party in an official capacity, when requested to do so by the attorney general.

(4) The operation of the laboratory shall conform to the rules and policies established by the attorney general.

History: 1973 c. 272; 1977 c. 260; 1981 c. 314.

An evaluation of drug testing procedures. Stein, Laessig, Indriksons, 1973 WLR 727.

165.78 Information center; training activities. (1) The division of law enforcement services shall act as a center for the clearance of information between law enforcement officers. In furtherance of this purpose it shall issue bulletins by mail or its telecommunication system. The division shall at all times collaborate and cooperate fully with the F.B.I. in exchange of information.

(2) The division shall cooperate and exchange information with other similar organizations in other states.

(3) The division may prepare and conduct informational and training activities for the benefit of law enforcement officers and professional groups.

History: 1977 c. 260.

165.79 Evidence privileged. (1) Evidence, information and analyses of evidence obtained from law enforcement officers by the laboratory is privileged and not available to persons other than law enforcement officers nor is the defendant entitled to an inspection of information and evidence submitted to the laboratory by the state or of the laboratory's findings, or to examine laboratory personnel as witnesses concerning the same, prior to trial, except to the extent that the same is used by the state at a preliminary hearing. Upon request of a defendant in a felony action, approved by the presiding judge, the laboratory shall conduct analyses of evidence upon behalf of such defendant. No prosecuting officer is entitled to an inspection of information and evidence submitted to the laboratory by the defendant, or of the laboratory's findings, or to examine laboratory personnel as witnesses concerning the same, prior to trial, except to the extent that the same is used by the accused at a preliminary hearing. Employes of the laboratory who made examinations or analyses of evidence shall attend the criminal trial as witnesses, without subpoena, upon reasonable written notice from either party requesting such attendance. Nothing in this section shall limit the right of a court to order the production of evidence or reports pursuant to s. 971.23 prior to trial.

(2) Upon the termination or cessation of the criminal proceedings, the privilege of the findings obtained by the laboratory may be waived in writing by the administrator and the prosecutor involved in the proceedings. The employes of the laboratory may then be subpoenaed in civil actions in regard to any information and analysis of evidence previously obtained in such criminal investigation, but the laboratory shall not engage in any investigation requested solely for the preparation for trial of a civil matter. Upon appearance as a witness or receipt of a subpoena or notice to prepare for trial in a civil action, or appearance either with or without subpoena, the laboratory shall be compensated by the party at whose request the appearance or preparation was made in a reasonable amount to be determined by the trial judge, which fee shall be paid into the state treasury. In fixing such compensation the court may give consideration to the time

spent in obtaining and analyzing the evidence for the purposes of criminal proceedings.

(3) (a) In this paragraph, "local health department" means a city, county, city-county or multicounty health department.

(b) At any preliminary examination, a report of the laboratory's or local health department's findings with reference to all or any part of the evidence submitted, certified as correct by the administrator, the head of the local health department or a person designated by either of them, shall, when offered by the state or the accused, be received as evidence of the facts and findings stated, if relevant. The expert who made the findings need not be called as a witness.

History: 1977 c. 260; 1979 c. 221; 1981 c. 20.

165.80 Cooperation with other state departments. For the purpose of coordinating the work of the laboratory with the research departments located in the university of Wisconsin, the attorney general and the university of Wisconsin may agree for the use of laboratories and physical facilities in the university and the exchange and utilization of personnel between the laboratory and the university. The university and crime laboratory cooperation council shall act in an advisory capacity to the attorney general.

165.81 Disposal of evidence. (1) Whenever the administrator is informed by the submitting officer or agency that physical evidence in the possession of the laboratory is no longer needed the administrator may, unless otherwise provided by law, either destroy the same, retain it in the laboratory or turn it over to the university of Wisconsin upon the request of the head of any department. Whenever the administrator received information from which it appears probable that such evidence is no longer needed, he may give written notice to the submitting agency and the appropriate district attorney, by registered mail, of his intention to dispose of the evidence and if no objection is received within 20 days after such notice was mailed he may dispose of such evidence.

(2) Any electric weapon, as defined in s. 941.295 (4), in the possession of the laboratory shall either be destroyed or turned over to an agency authorized to have electric weapons under s. 941.295 (2).

History: 1981 c. 348.

165.83 Criminal identification, records and statistics. (1) DEFINITIONS. As used in this section and s. 165.84:

(a) "Division" means the division of law enforcement services.

(b) "Law enforcement agency" means a governmental unit of one or more persons employed full time by the state or a political subdivision of the state for the purpose of preventing and detecting crime and enforcing state laws or local ordinances, employes of which unit are authorized to make arrests for crimes while acting within the scope of their authority.

(c) "Offense" means an act which is a felony, a misdemeanor or a violation of a city, county, village or town ordinance.

(2) The division shall:

(a) Obtain and file fingerprints, descriptions, photographs and any other available identifying data on persons who have been arrested or taken into custody in this state:

1. For an offense which is a felony.

2. For an offense which is a misdemeanor or a violation of an ordinance involving burglary tools, commercial gambling, dealing in gambling devices, contributing to the delinquency of a child, dealing in stolen property, controlled substances under ch. 161, firearms, dangerous weapons, explosives, pandering, prostitution, sex offenses where children are victims, or worthless checks.

3. For an offense charged as disorderly conduct but which relates to an act connected with one or more of the offenses under subd. 2.

4. As a fugitive from justice.

5. For any other offense designated by the attorney general.

(b) Accept for filing fingerprints and other identifying data, taken at the discretion of the law enforcement agency involved, on persons arrested or taken into custody for offenses other than those listed in par. (a).

(c) Obtain and file fingerprints and other available identifying data on unidentified human corpses found in this state.

(d) Obtain and file information relating to identifiable stolen or lost property.

(e) Obtain and file a copy or detailed description of each arrest warrant issued in this state for the offenses under par. (a) but not served because the whereabouts of the person named on the warrant is unknown or because that person has left the state. All available identifying data shall be obtained with the copy of the warrant, including any information indicating that the person named on the warrant may be armed, dangerous or possessed of suicidal tendencies.

(f) Collect information concerning the number and nature of offenses known to have been committed in this state, the legal action taken in connection with such offenses from the inception of the complaint to the final discharge of the defendant and such other information as may be useful in the study of crime and the administration of justice. The administrator of