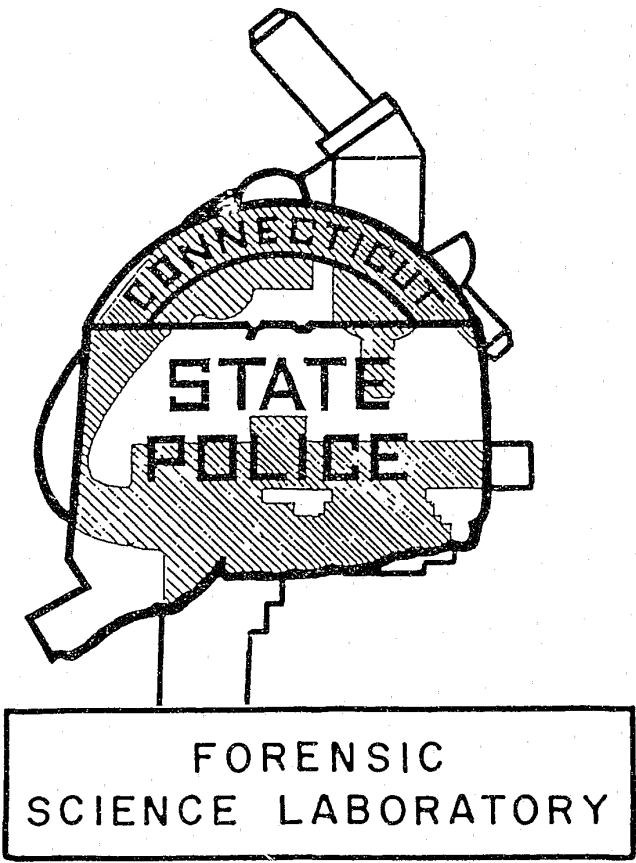


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STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC SAFETY



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

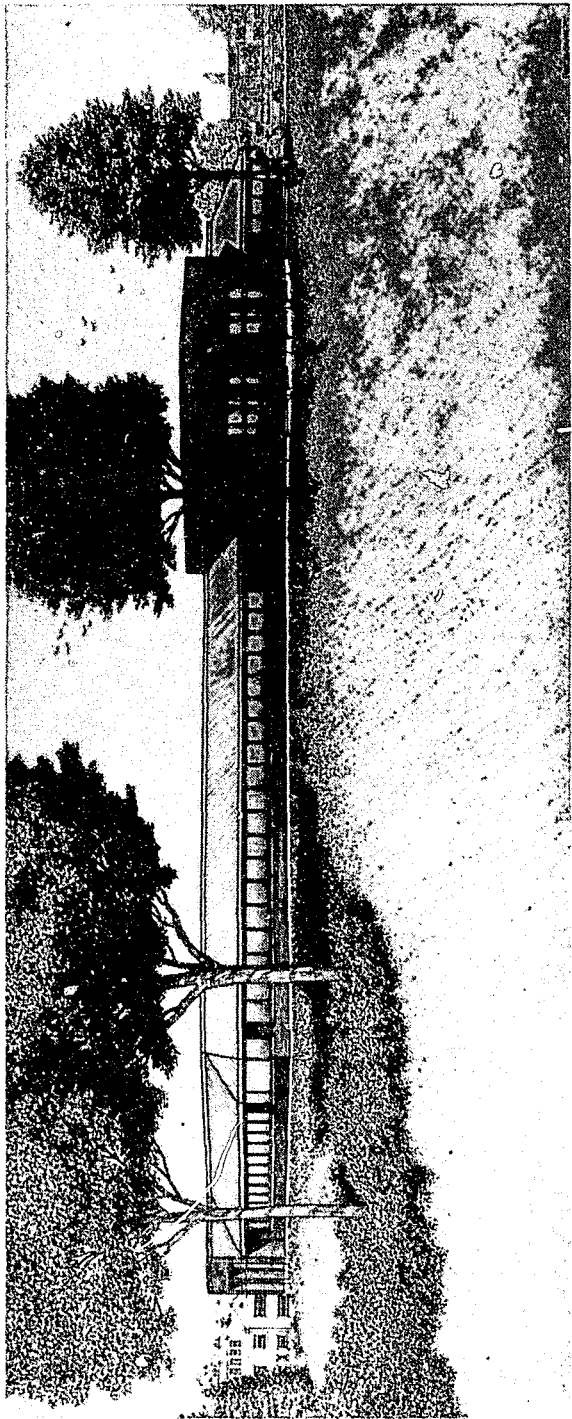
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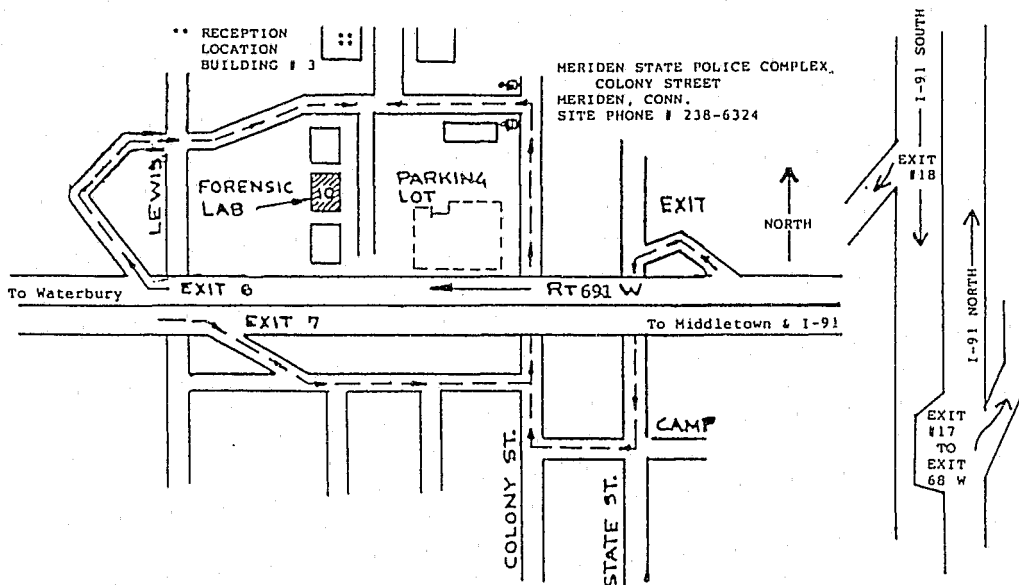
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Connecticut State Forensic
Laboratory

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DIRECTIONS TO THE "FORENSIC LABORATORY

- TO REACH THE DEPARTMENT OF PUBLIC SAFETY - MERIDEN COMPLEX:
- FROM I-91 SOUTH TAKE EXIT 18 TO ROUTE 691 WEST TO EXIT 6, LEWIS AVE.
 - FROM I-91 NORTH TAKE EXIT 17 TO EXIT 68W, THIS WILL PUT YOU ON ROUTE 691 WEST TO EXIT 6, LEWIS AVE.
 - FROM ROUTE 15, FOLLOW TO THE END WHERE IT MEETS WITH I-91, GO STRAIGHT TO EXIT 68W, THIS WILL PUT YOU ON ROUTE 691 WEST TO EXIT 6, LEWIS AVE.
 - FROM I-84 TAKE THE "MERIDEN - 691" EXIT TO EXIT 7, FOLLOWING THE STREET TO ITS END. TURN LEFT ON COLONY STREET, GO UNDER THE BRIDGE TO THE FIRST DRIVEWAY ON THE LEFT, BETWEEN TWO STONE PILLARS.

Department of Public Safety
Forensic Science Laboratory

Dr. Henry C. Lee	Director
Sgt. Robert J. Mills	Assistant Director
CRIMINALISTICS	Elaine M. Pagliaro
Chemistry	Dr. Jack Hubball
Serology-Biochemistry	Mary Beth Guman Beryl Novitch Joy Reho Karen Roncarti Patricia Johannes
DNA	Dr. Carll Ladd Deborah Messina
Trace-Instrumentation	Kiti Settachatgul Robert O'Brien
IDENTIFICATION	
Questioned Documents	William Duane
Firearms-Toolmarks	TFC David Gibbs Edward McPhillips
Latent Fingerprints	Robert S. Finkle Thomas O'Brien Michael Supple
LABORATORY SUPPORT SERVICES	Kenneth Zercie
Evidence Receiving	Diana Howard Melissa Edwards
Adminstration	Barbara Martin
Photography	Anthony Gura Paul Hebert Paul Penders Joseph Weronick
RECONSTRUCTION	Daniel Tramontozzi

In 1935, Commissioner Anthony Sunderland established the Bureau of Identification within the State Police Department, creating a major case fingerprint file to be handled by this Bureau. Due to space constraints, the Bureau of Identification was moved to 100 Washington Street in 1938. In 1941 the Connecticut Legislature officially recognized the State Bureau of Identification by passing a bill establishing this Bureau as a state agency.

Under Commissioner Cleveland B. Fussenich, the Bureau of Identification was relocated to the old State Police Academy building in Bethany. The central location of Bethany provided easier access to the submitting agencies from across the State. Services offered by the "Crime Laboratory" expanded and in 1975 the Forensic Science Laboratory was made an independent unit under the auspices of the Connecticut State Police.

The appointment of Dr. Henry C. Lee as Chief Criminalist to the Forensic Science Laboratory in 1978 began another phase of development for the Laboratory. State of the art techniques and procedures were implemented under his guidance during the 1980's. Soon the Bethany facility proved inadequate to house the acquired analytical instrumentation necessary to carry out these procedures.

A more suitable location was found which would also allow for some expansion -- Building 10 on the Mulcahy Complex in Meriden.

To serve the increasing demands of law enforcement agencies throughout the state, additional sections which required expertise in various scientific disciplines were added to the Laboratory. The Laboratory currently is staffed with administrative and scientific personnel assigned to four sections consisting of eighteen units. As outlined in Connecticut Public Act 83-66, these sections function to provide investigative and professional leads through the timely documentation and examination of physical evidence, the reconstruction of crimes, and expert testimony leading to the arrest, conviction or clearance of a suspect.

Requirements to offer additional services due to advances in Forensic Science and the expectations of the criminal justice system resulted in additional expansion during the 1980's and 1990's. Acquisition of technologies such as laser and alternate light capabilities, computerized image enhancement, and DNA analysis placed further strain on the existing Laboratory structure.



The implementation of Phase I of the Laboratory Building plan in the Spring of 1993 allows for the construction of a state-of-the-art facility which will house the Criminalistics, Support Services, and Reconstruction Units of the Laboratory. Phase II would provide updated space for the Identification Units and the facilities needed to implement the use of an automated fingerprint identification system (AFIS). With up to date safety, technical, and communication features, as well as a location for the training of State Police and local law enforcement personnel, the Laboratory can approach the 21st century with a facility equal to the quality of work for which the Laboratory has become known.

The primary function of the Laboratory is to examine physical evidence for the purpose of determining, for example:

- (1) That a crime was committed
- (2) That the crime is connected to the victim or perpetrator(s)
- (3) That contact occurred between the scene and the victim(s) and/or the perpetrator(s)
- (4) That a suspect is not associated with a crime
- (5) Investigative leads.

In addition, the Forensic Laboratory coordinates and disseminates new information to investigators and members of the judicial community and develops and researches new scientific techniques.

The Forensic Science Laboratory is responsible for the examination and analysis of evidentiary materials in areas including Chemistry, Arson, Firearms, Toolmarks, Questioned Documents, Serology, Biochemistry, Trace Evidence, Latent Fingerprints, Imprints and Impressions, Instrumentation and DNA. In addition, the Laboratory often is requested to assist in the scientific investigations of crime scenes, provide training and technical assistance in various fields and assist with the reconstruction of a crime.



FORENSIC LABORATORY SERVICES

ARSON - CHEMISTRY

The analysis of debris from fire scenes to identify the presence of accelerants is the primary function of the arson section of the Laboratory. Accelerants remaining in the debris or other physical evidence are isolated by appropriate techniques and identified utilizing Gas Chromatographic methods and Mass spectrometry. In addition, explosive residues and unknown substances are identified by classical chemical and new instrumental techniques.



TRACE - INSTRUMENTATION

The trace analyst combines the methodologies of microscopical, instrumental and chemical techniques in the examination of hairs, fibers, paints, glass, soil, plant material, insect parts, minerals and other particles found in small size or quantity. While individualization of these materials is difficult, important association can be made among evidence collected at a crime scene or from a victim or suspect.

Instrumental analysis of GSR Kits and other items for the presence of gunshot residue may indicate a person fired or handled a weapon or was in the area of a weapon which was recently fired. These analyses are carried out using the scanning electron microscope (SEM/EDX) and atomic absorption (AA) spectroscopy. The determination of weapon to target distance may also be required for a more complete reconstruction of the incident. Test firings of the suspected weapon are carried out under standard Laboratory conditions to obtain patterns of deposit which can be compared to the physical evidence.

SEROLOGY - BIOCHEMISTRY

The identification of blood and body fluids in liquid or stain form and the individualization of these samples is carried out by the Serology - Biochemistry section of the Laboratory. The principles and techniques of immunology, biochemistry, hematology, and molecular biology are employed to determine what type of stain was submitted, if the stain is human or from some other animal species, and what blood group substances or isoenzymes may be present in the stain, if it is human.

Major cases such as homicides and sexual assaults typically involve the analysis of blood, semen, tissues, or other physiological fluids. The biological materials which may be present in these and other types of cases provide information on the type of sample and the genetic markers present. These results can then be compared to known body fluids for inclusion or exclusion of a suspect or victim as a source of the evidence.



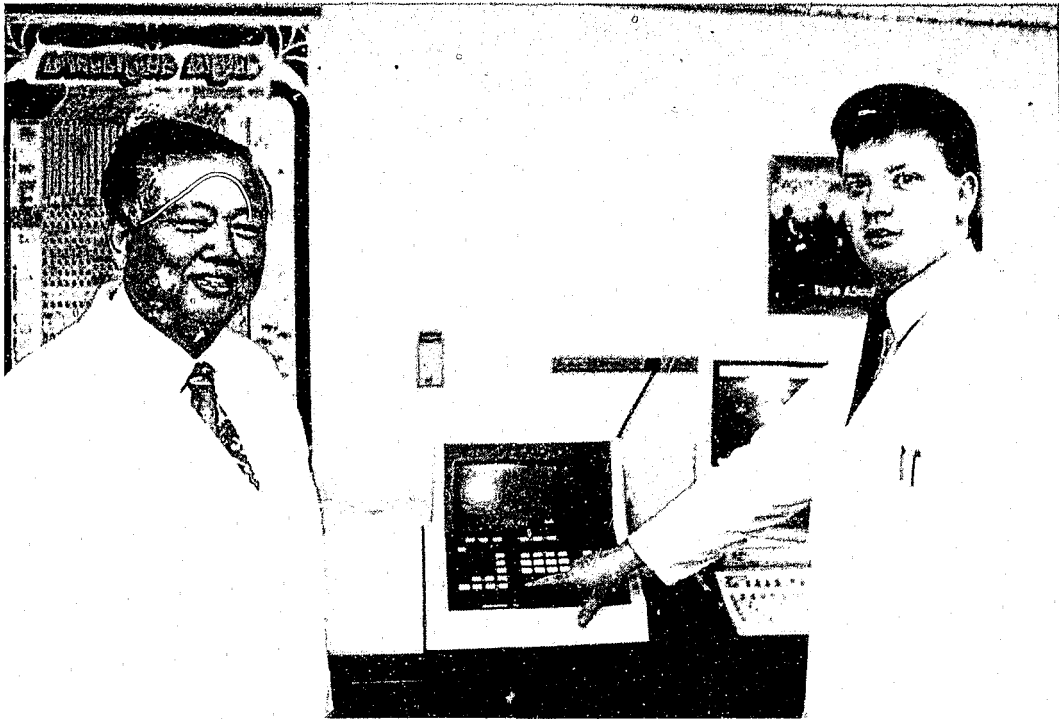


DNA

Biological materials composed of or containing cells with a nucleus can be analyzed for the DNA profile of the individual who deposited the sample. Since the DNA of all individuals, except for identical twins, is unique the potential for individualization of a sample is great utilizing this method .

The DNA, the genetic material of the cell, must be isolated and purified prior to testing. Once DNA is obtained those techniques currently employed in the Forensic Laboratories involve: (1) identification of variations in the length of specific portions of the DNA molecule caused by inherited, repeated sequences, called "RFLP" analysis and (2) amplification of variable, small portions of DNA by the Polymerase Chain Reaction (PCR) and detection of these products. One of the most commonly used PCR Systems is the testing of the HLA-DQ alpha types.

DNA has been obtained from blood, semen, saliva, bone, and other tissues. In addition, employing differential DNA extraction procedures on victim-semen mixtures allows for the isolation of sperm-only DNA; this has obvious important applications in the analysis of sexual assault cases.



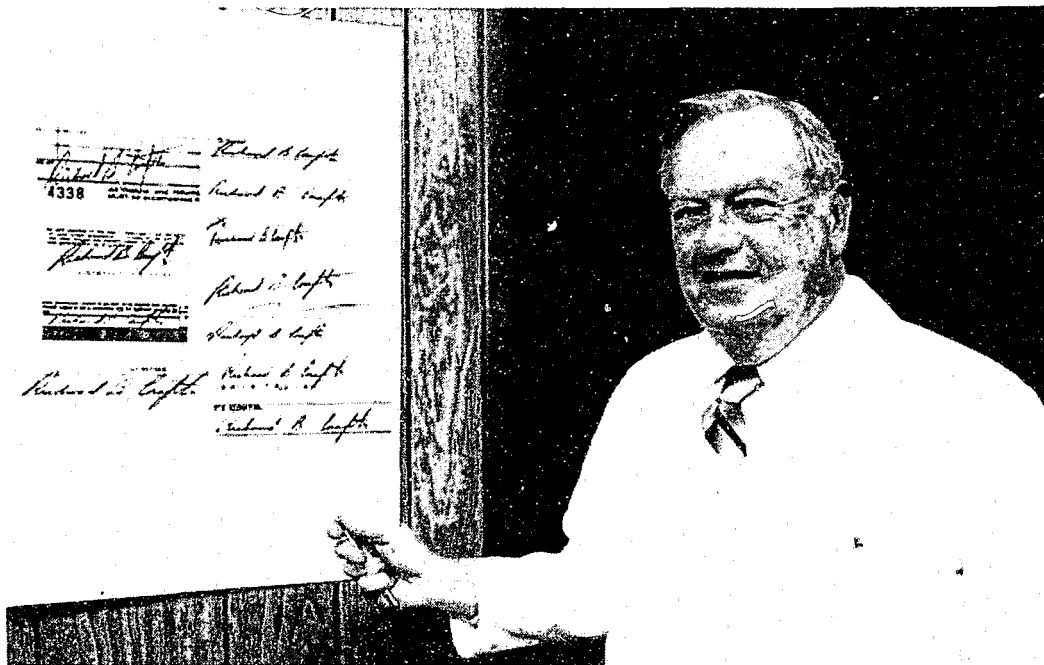
LATENT FINGERPRINTS

The Latent Fingerprint examiners are responsible for processing latent fingerprints on evidence submitted to the Laboratory. Many physical and chemical methods for the detection and visualization of latent fingerprints may be employed including traditional methods such as powder dusting and ninhydrin or super glue treatment; methods with specialized applications include laser and alternate light examination, chemical enhancement, and bloody print enhancement.

After latent fingerprints have been developed, these are photographed and individualizing characteristics of the latent fingerprint, the minutia, compared to the suspect's or other inked prints for identification or elimination purposes. A positive match results in the absolute identification of the individual source of the latent fingerprint.

QUESTIONED DOCUMENTS

The examinations of handwriting, typewriting, printing, ink and paper, as well as other aspects of a document or writing instrument are carried utilizing instrumental and photographic techniques. Examinations can involve identifying the source or writer of a document, determining authenticity of a signature, or the age of a document. Alternate light examination of documents may allow for the detection of alterations and obliterated writings or erasures. Other instruments such as the "ESDA" and computer enhancement enable the document examiner to visualize indented and other writings.



IMPRINTS

Imprint and impression evidence includes various types of two- or three- dimensional markings, such as footwear impressions, tire impressions, and footprints. These patterns are documented photographically, with casting materials, alternate light, or electrostatic "dust" print techniques.

Determination of the class characteristics of an impression allows for the identification of the type of object which made the marking and, at times, the manufacturer. The identification and comparison of individual characteristics between the questioned imprint and a known exemplar may result in the determination that a particular object within the class made that impression or imprint. When comparing imprints or impressions the examiner must consider the effects of casting materials, if used, the material in which the imprint or impression was made, the method of development of the imprint or impression, and other factors.

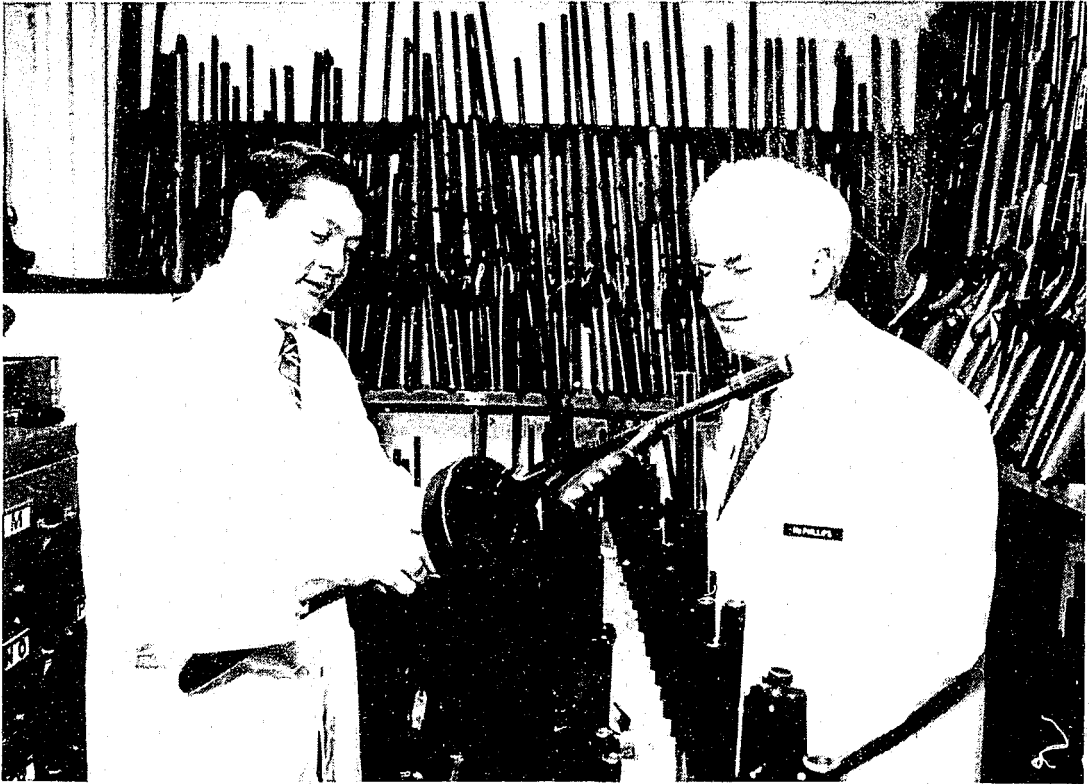
FIREARMS AND TOOLMARKS

The examination of firearms, discharged bullets, cartridge cases, shot shells, and other ammunition and various weapons are all conducted by the firearms section. The examiners may attempt to determine what kind of weapon fired the bullet, if a particular weapon fired a bullet or cartridge, or what type of ammunition was used. In addition, the test firing of weapons is conducted to determine if a weapon is functional.

Often toolmarks are produced during the course of many crimes whenever a force is applied between two objects, such as a screwdriver and a door plate or when a cutting instrument is used. Because of the length of time required to reproduce a questioned toolmark and conduct a microscopical comparison, the detailed comparison of a tool left at the crime scene with a tool mark would be most justified when the suspect tool can be associated with the incident or perpetrator by investigative means or by analysis of additional transfer evidence, such as paint.

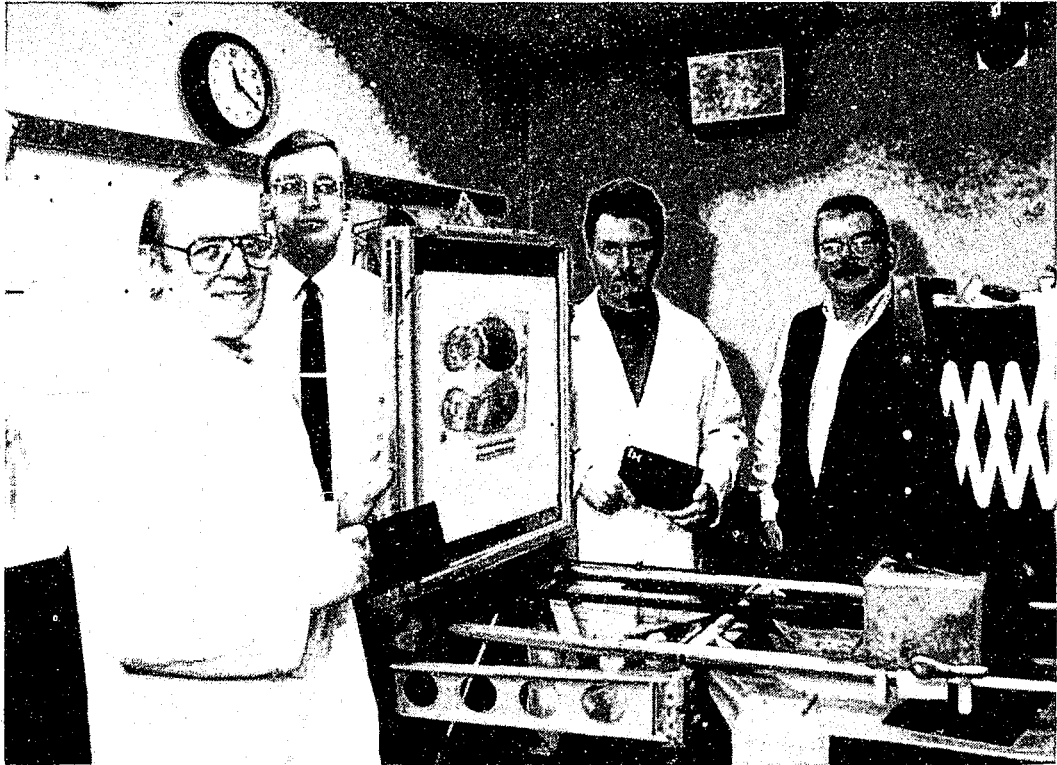
Restoration of serial numbers or other altered impressions in metal is also carried out in this section of the Laboratory.





FORENSIC PHOTOGRAPHY

Specialized techniques in the documentation of crime scenes, accident scenes, and physical evidence are used by the Forensic Photographers. Photographic enhancement, Ultraviolet (UV) or Infrared (IR) photography, and various lighting techniques may be employed to demonstrate a particular characteristic on physical evidence or to document the patterns at a scene. The skills of the Laboratory photographers are also employed for the preparation of court exhibits and other photographic displays for the Department of Public Safety.



RECONSTRUCTION

After obtaining data from physical evidence analyses and from investigative procedures it may be necessary to attempt to determine the course of a crime, limiting the possibilities which resulted in the scene or evidence encountered. The Reconstruction section of the Laboratory reviews all crime scene photographs, reports, videotapes, notes and measurements available; visiting the crime scene whenever possible at the time of the incident and direct observation of the scene and patterns is most desirable for reconstruction purposes.

Upon review of these materials and the results of the analyses of physical evidence, a reasonable interpretation of the patterns and explanation of the crime and related events may be given. While several interpretations can be given for the observed data, certain possible causes of patterns and observations can be eliminated.

