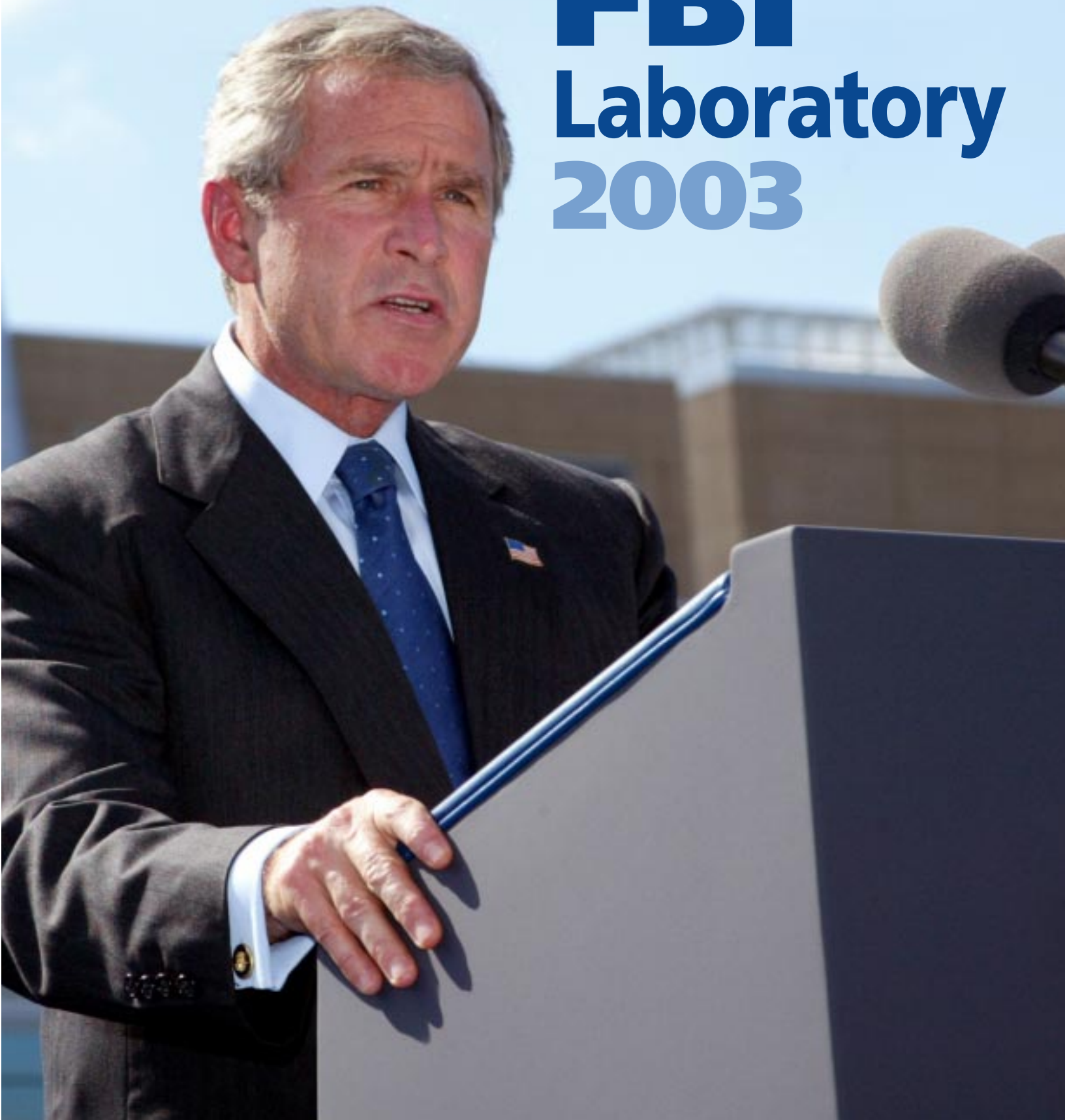
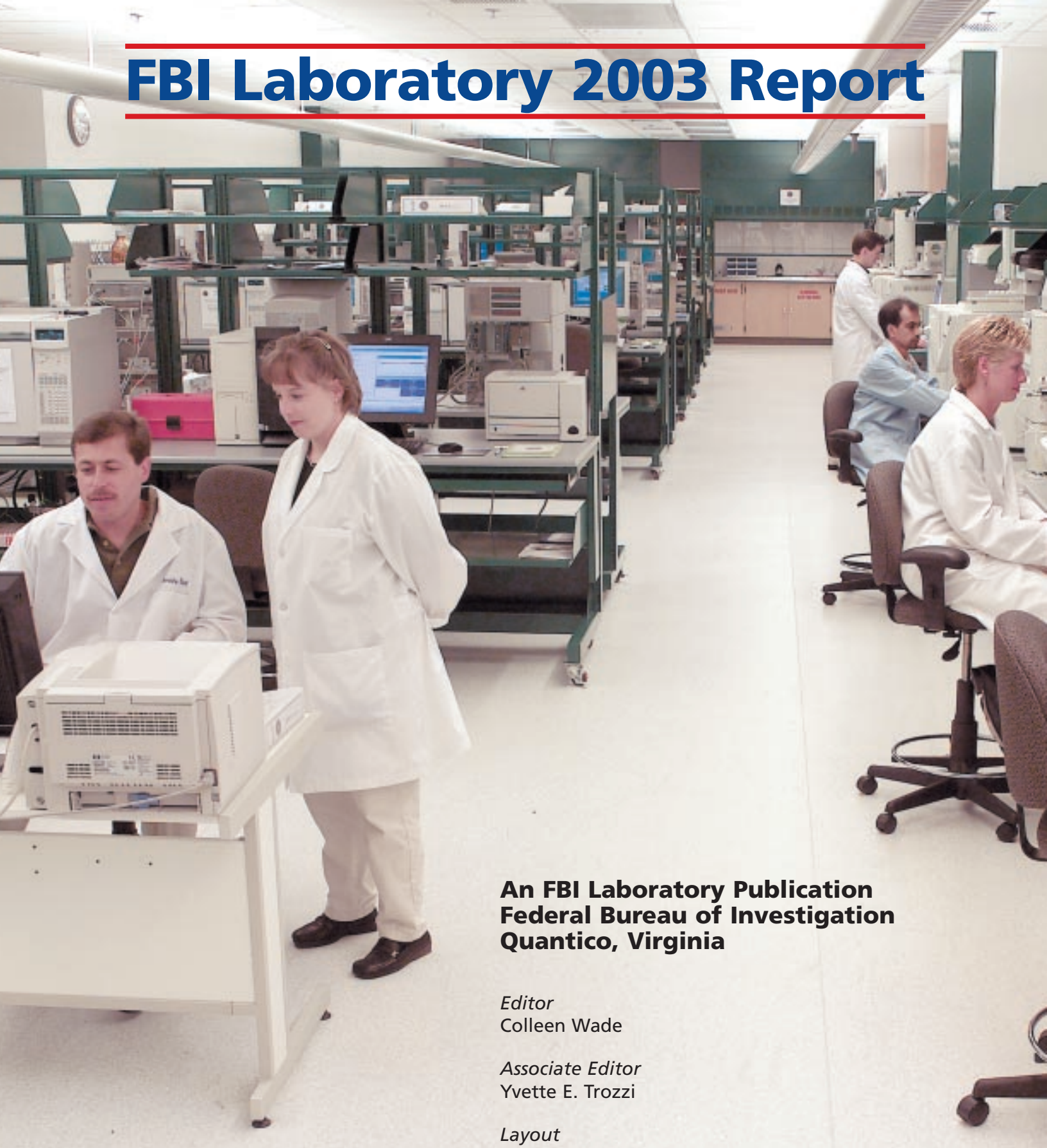
U.S. Department of Justice
Federal Bureau of Investigation

FBI Laboratory 2003



FBI Laboratory 2003 Report



An FBI Laboratory Publication
Federal Bureau of Investigation
Quantico, Virginia

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EEI Communications, Inc.

The FBI Laboratory 2003 Report
may also be viewed online at
www.fbi.gov/hq/lab/labannual03.pdf

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Message from the FBI Laboratory Director

Dwight E. Adams

During 2003 the FBI Laboratory focused its efforts on the war against terrorism, strengthening its operational response programs and expanding its forensic capabilities to include the analysis of chemical and biological weapons.

The Laboratory's Hazardous Materials Response Unit trains, equips, and provides support to 21 FBI response teams operating across the United States. These teams have responded to numerous threats involving hazardous materials and weapons of mass destruction. The Laboratory's new Chem-Bio Sciences Unit is working with the U.S. military and national laboratories to provide forensic examinations of hazardous chemical, biological, and nuclear materials. These initiatives are being supported by an intensive counterterrorism research effort aimed at developing groundbreaking technologies for field-portable hazardous materials detection, microbial genetics, and databases for determining the source of chemical and biological terrorist attacks.

This year the Laboratory began developing the multiagency Terrorist Explosive Devices Analytical Center. When fully operational, the Center will provide comprehensive forensic analysis and intelligence on explosive devices used by terrorists to the U.S. military and other federal and international agencies.

The Laboratory also began a significant upgrade to the Bomb Data Center's Hazardous Devices School at the Redstone Arsenal in Huntsville, Alabama. This is the only facility providing training for the 460 state and local bomb squads in the United States.

The Evidence Response Team Unit trains the 139 FBI Evidence Response Teams throughout the United States and coordinates deployments to major incidents, including the Riyadh, Saudi Arabia, bombings and the Columbia Space Shuttle disaster.

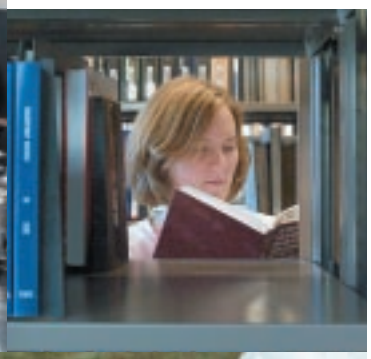
The FBI's new Laboratory was selected by President George W. Bush as the backdrop for his nationally televised, live speech on the eve of the two-year anniversary of the September 11, 2001, terrorist attacks. President Bush was joined by Attorney General John Ashcroft, Homeland Security Secretary Thomas J. Ridge, Homeland Security Advisor General John A. Gordon, and FBI Director Robert S. Mueller as he highlighted the progress the United States and our allies have made in the war against terrorism.

During the past year, the Laboratory hosted broadcasts of ABC's *Good Morning America* and the History Channel's *Modern Marvels.* The shows described the capabilities and successes of forensic science and the FBI Laboratory to national television audiences.

During 2003 the FBI Laboratory focused its efforts on the war against terrorism, strengthening its operational response programs and expanding its forensic capabilities to include the analysis of chemical and biological weapons.

Media coverage is a good way to build awareness and enthusiasm about forensic science; however, the day-to-day work performed by FBI Laboratory personnel is more impressive. The *FBI Laboratory 2003 Report* describes the capabilities and structure of the Laboratory. The *Report* also highlights some domestic and international terrorism investigations in which our forensic scientists and crime scene responders assisted in thwarting acts of terrorism or bringing perpetrators to justice.

For example, the Latent Print Unit made a pivotal "cold hit" using the FBI's Integrated Automated Fingerprint Identification System that led to the identification and capture of Lee Boyd Malvo and John Allen Muhammad. The successful resolution of this nationally publicized Washington, DC, area sniper-murder spree, which left ten dead, including FBI analyst Linda Franklin, reflects the commitment and resolve of our forensic examiners.



In another example, the testimony of FBI Laboratory fingerprint specialists and forensic chemists helped bring Clayton Lee Waagner to justice. Shortly after the deadly anthrax attacks in 2001, Waagner sent threatening letters claiming to contain anthrax to abortion clinics across the country. Waagner was convicted of 51 of 53 counts charged in his indictment.

Also this year, the Laboratory's Hazardous Materials Response Unit deployed to collect, screen, and transport evidence from Kenneth R. Olsen's home, car, and workspace. This search led to the first successful conviction under the Chemical Weapons Statute for possession of ricin, a powerful biological toxin with the potential of killing thousands of people.

These successes are not accomplished alone, and the FBI Laboratory continues to benefit from its partnerships with national, state, and local laboratories and academia.

Our most successful partnership is the Combined DNA Index System (CODIS), which enables federal, state, and local forensic laboratories to exchange and compare DNA profiles electronically, linking serial violent crimes to each other and to convicted offenders. Currently, 175 laboratories are using CODIS; 161 of these laboratories are connected to the National DNA Index System (NDIS). To date, this system has aided more than 10,000 investigations and provided more than 10,000 forensic and offender matches.

Media coverage is a good way to build awareness and enthusiasm about forensic science; however, the day-to-day work performed by FBI Laboratory personnel is more impressive.

Regional mitochondrial (mtDNA) laboratories will partner with the Laboratory to augment the Bureau's capacity for no-cost mtDNA analysis in forensic and missing persons cases. As a result, the Bureau's capacity to deliver mtDNA analysis to the criminal justice system is expected to double by 2005.

The following outreach programs promote additional partnerships and cooperation with state and local law enforcement and academic communities:

- The Research Partnership Program is a teaming of FBI and state and local forensic scientists to facilitate the transfer of new technologies to state and local laboratories and to generate new forensic databases.
- The Specialized Training Program provides hands-on training in the forensic science fundamentals to laboratory personnel working in state, local, national, and international law enforcement agencies.
- The Visiting Scientist Program provides a connection between the Laboratory and academia, offering university students, postgraduates, and faculty the opportunity to enhance their education by participating in forensic research projects at the Laboratory.
- The Training Partnership Program provides a means for recognized training institutes to work with the FBI under a common set of guidelines to develop training that could be offered by any of the participants.
- The Laboratory sponsors Scientific Working Groups that improve discipline practices and build consensus with federal, state, and local forensic communities.

For 31 years the FBI Laboratory has hosted the annual Crime Laboratory Development Symposium, which provides training in management science for state, local, and federal forensic laboratory directors. In conjunction with the meeting, the Laboratory hosted its first annual research and development review, which included an overview of the Research Partnership Program and summaries of current research and development in the biological, chemical, and physical sciences. Five topics were covered: the Automation of Forensic DNA Analysis, Human Identification, Explosive Devices and Field Analysis, Forensic Chemistry, and Validation of the Basis for Patterned Evidence Identification.

At the core of the Laboratory's effort are nearly 700 highly motivated employees, whose dedication and commitment are best reflected by the inscription mounted on a rock in front of our 470,000-square-foot Laboratory building in Quantico, Virginia.

> Behind every case is a victim—man, woman or child—and the people who care for them. We dedicate our efforts and the new FBI Laboratory building to those victims.

Dwight E. Adams, Ph.D.
FBI Laboratory Director
Federal Bureau of Investigation

President George W. Bush Visits the Laboratory

President Bush delivered a nationally televised speech on September 10, 2003, from the FBI Laboratory in Quantico, Virginia. The speech focused on homeland security and progress in the United States' war against terrorism. He publicly recognized Director Mueller and Bureau employees for undertaking "so much of the hard and essential work" in combating terrorism. "The FBI, much to the chagrin of the enemy, is fully engaged in the war on terror," the President said. "America is proud of your efforts."

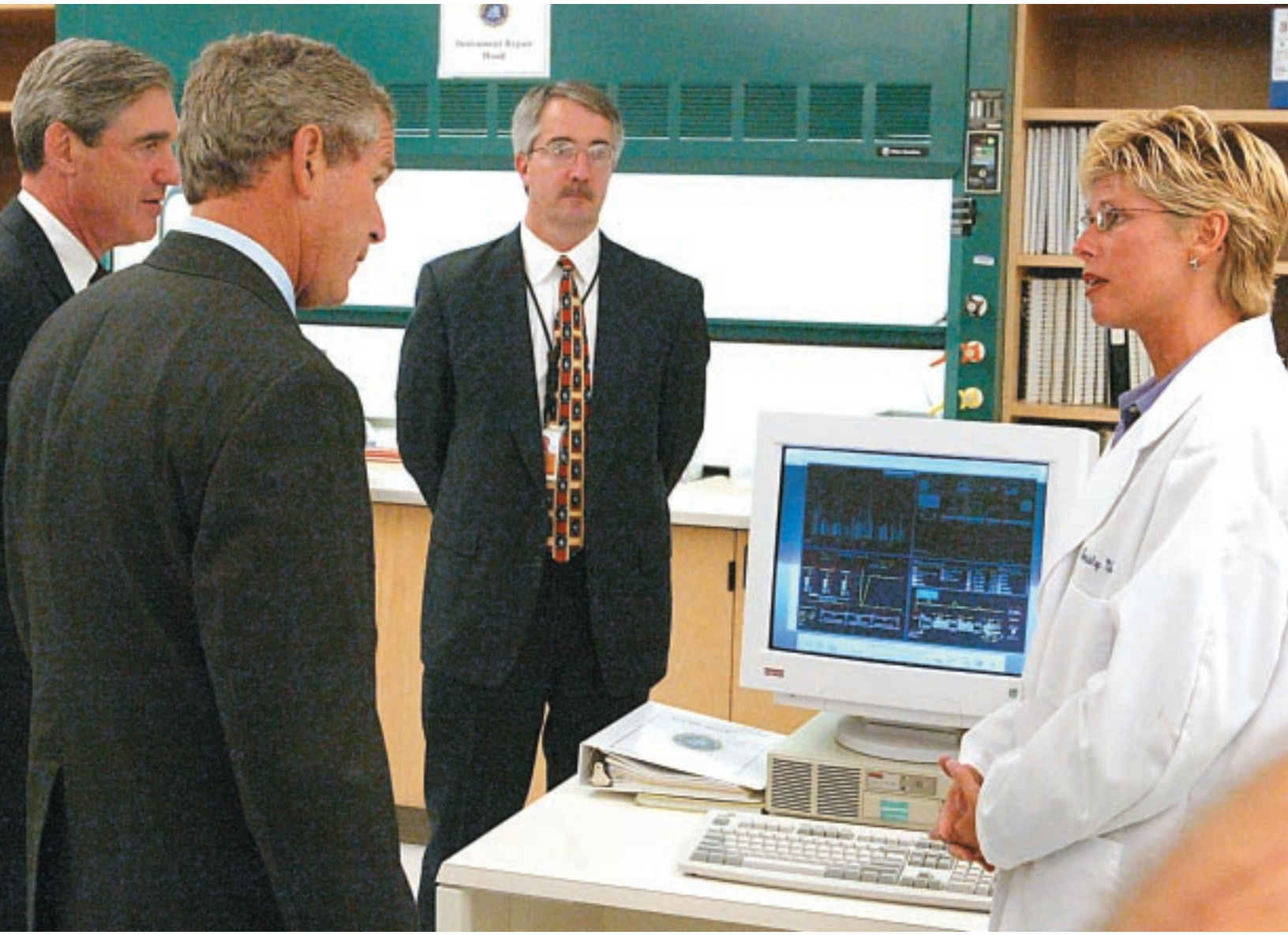
President Bush addressed an audience of 2,500 that included Bureau and Drug Enforcement Administration personnel, FBI Special Agent trainees, U.S. Marines, and first responders from local communities. In his speech, he called for enhanced antiterrorism legislation to aid law enforcement.

Accompanying the President were Attorney General John Ashcroft, Homeland Security Secretary Thomas J. Ridge, Homeland Security Advisor General John A. Gordon, and FBI Director Robert S. Mueller. The dignitaries were given a tour of the Laboratory that included the Chemistry, Explosives, and Firearms-Toolmarks Units.

Good Morning America Broadcasts from the Laboratory

On May 21, 2003, ABC television's *Good Morning America* provided the "first broadcast ever from inside the FBI" at the Laboratory in Quantico, Virginia. The two-hour program featured an interview with FBI Director Robert S. Mueller; an interview with Supervisory Special Agent Douglas W. Deedrick regarding the Lisk/Silva serial-killer investigation, which took five years to solve and involved the expertise of many Laboratory examiners; a tour of the Laboratory's firearms collection; and a demonstration of the Andros Mark 5 A1, a state-of-the-art robot used in explosives operations by Bomb Data Center personnel.

Many of the operations of the FBI Academy were also highlighted, including Special Agent training in Hogan's Alley, defensive driving training, and advanced firearms instruction. The Violent Crimes Unit's 53-year-old *Ten Most Wanted Fugitives* list was also covered.

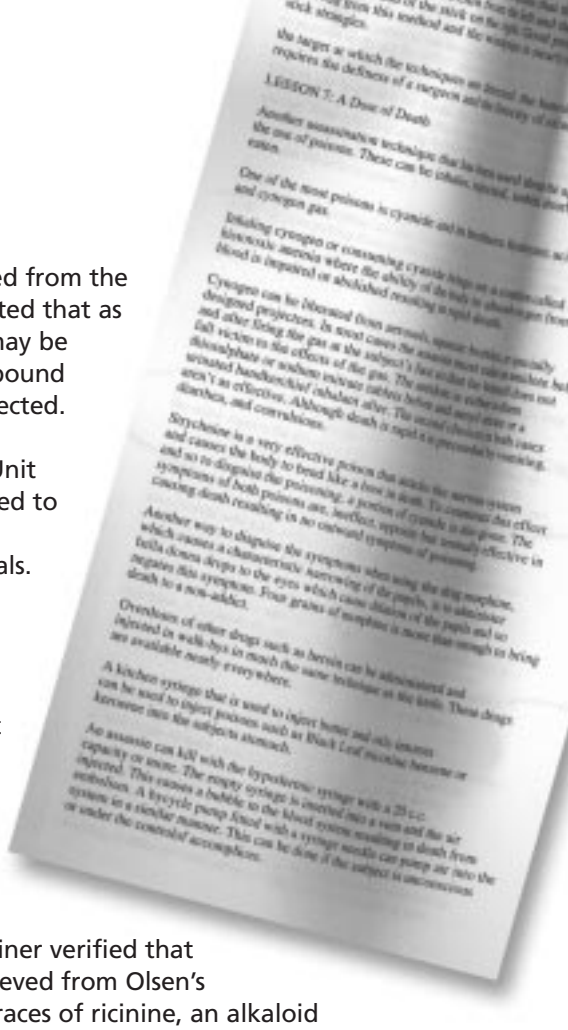


Investigations

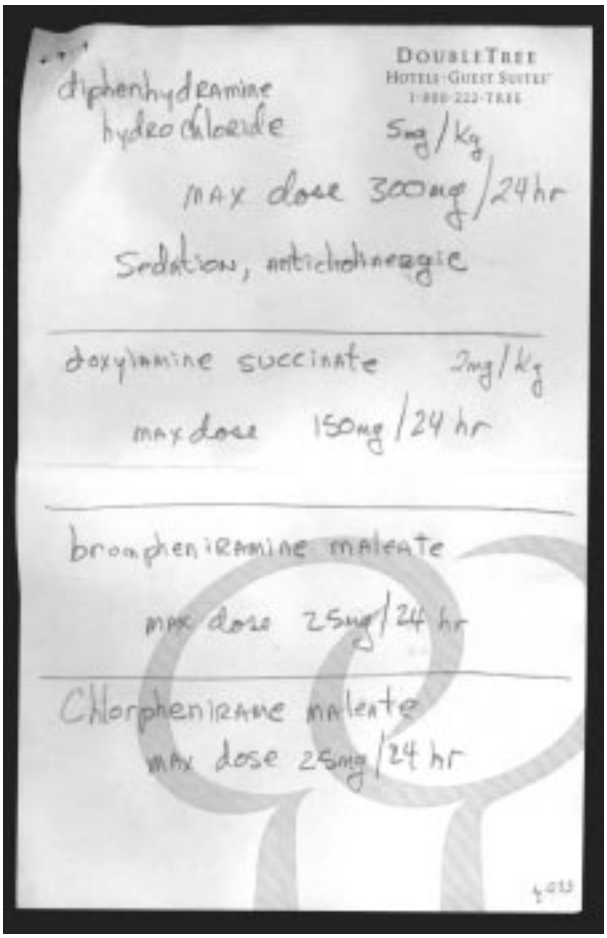
Ricin Investigation

Kenneth R. Olsen was a technician for Agilent Technologies in Liberty Lake, Spokane County, Washington, before being terminated for downloading illicit information from the Internet while at work. The information detailed how to kill with undetectable poisons, how to dispense ricin, and how to make explosives. At the time of his arrest, approximately three grams of a suspicious white powder that proved to be ricin were found in a makeshift laboratory in his office workspace.

Laboratory Hazardous Materials Response Unit personnel collected, screened, and transported evidence found in Olsen's home, car, and workspace. The U.S. Army Medical Research Institute for Infectious Diseases in Fort Detrick, Maryland, identified the powder taken from Olsen's office workspace as 20 percent ricin. Ricin is a toxic protein derived from the castor seed. It is estimated that as little as 0.2 to 0.4 mg may be sufficient to kill a 165-pound person if inhaled or injected.



Laboratory Chemistry Unit personnel were deployed to Fort Detrick to assist in reanalyzing the materials. When a sample of the material was rendered safe, it and additional evidence from the investigation were sent to the Laboratory for testing in the Chemistry and Questioned Documents Units.



A Chemistry Unit examiner verified that many of the items retrieved from Olsen's workspace contained traces of ricinine, an alkaloid from the seeds and leaves of the castor plant. In addition, the examiner identified the chemicals recovered from Olsen's workspace and testified in court that they were the same chemicals mentioned in the ricin recipes Olsen possessed.

An examiner from the Questioned Documents Unit identified Olsen as the writer of questioned entries appearing in numerous documents, including a how-to-kill manual. These entries supported the government's claim that Olsen was recording the ingredients and amounts necessary to produce various poisonous recipes.

On June 19, 2002, after a ten-month investigation, Kenneth R. Olsen was arrested on federal charges of possessing a biological weapon with intent to use it. In July 2003 Olsen was convicted on two charges for the possession of ricin under Title 18 U.S. Code Sections 175 and 229, which pertain to biological and chemical agents, respectively. This was the first successful conviction under the Chemical Weapons Statute (18 USC 229). In October 2003 he was sentenced to more than 13 years in prison and fined $22,900 for hazardous waste cleanup.

Sniper Attacks Investigation

In October 2002 sniper attacks paralyzed the Washington, DC, area. A multijurisdictional sniper task force was established to investigate multiple deaths in several states. Latent prints, DNA, trace, and questioned documents evidence was recovered from some of the crime scenes and sent to the Laboratory for analysis.

Latent Prints

Law enforcement officials from the Montgomery, Alabama, Police Department noticed similarities between the Washington, DC, area attacks and a killing in their jurisdiction. They requested that Latent Print Unit personnel examine evidence seized in connection with their case.

A Latent Print Unit examiner entered latent fingerprints from the Alabama evidence into the Integrated Automated Fingerprint Identification System (IAFIS). IAFIS returned Lee Boyd Malvo's name. After manual comparisons of the candidate image and the latent fingerprints developed on a gun catalog found at the Alabama crime scene, Malvo's identity was confirmed.

This information was sent to the U.S. Immigration and Naturalization Service to see if additional information was available from Malvo's arrest record for an immigration violation. The U.S. Immigration and Naturalization Service returned a second name taken from text associated with Malvo's arrest—John Allen Muhammad.

A Unit examiner identified the suspects' fingerprints on a bag discovered at the Ashland, Virginia, shooting; on a laptop computer stolen from a victim in Clinton, Maryland; and on computer-generated documents.

The latent print examiner relayed this information to the task force, and within 12 hours, Muhammad and Malvo were arrested at a Maryland highway rest stop.

DNA and Trace Evidence

A note inside a plastic bag left at the scene of the Ashland, Virginia, Ponderosa Steak House shooting detailed the snipers' demands. Nuclear DNA that matched Malvo was recovered from the bag. Additional evidence from other scenes, including a pen barrel, another bag, another note, and a brown glove, also yielded nuclear DNA results that directly linked Malvo and/or Muhammad with crime scenes. When Malvo and Muhammad were apprehended, a weapon and parts of a weapon had nuclear DNA matching that of the suspects.

Hairs consistent in microscopic characteristics to the suspects' hair were found in a duffel bag and on foam pieces left at a crime scene, and several hairs found on a coat at a scene exhibited similarities and differences to the known hairs obtained from Malvo. These hairs were submitted for mtDNA analysis and associated to Malvo. Other hairs found at a crime scene were analyzed using mtDNA technology and were associated to Muhammad.

Dark-blue nylon fibers, a light-gray nylon fiber, and a white polyester fiber were found in debris from a bag and on a cotton swab found at two of the homicide scenes. These fibers were consistent to fibers comprising the suspects' vehicle seats.

A brown work glove at one of the crime scenes was found to be similar to a brown work glove found in the suspects' vehicle. However, small differences were noted in overall length and color of the two gloves. Trace Evidence Unit personnel asked evidence technicians from across the nation to buy brown work gloves and submit them to the Laboratory. After examining the submitted known samples, personnel determined that the glove at the scene and the glove in the vehicle appeared to have been made by the same company. The company was contacted and asked to send sample gloves for examination. The sample gloves also showed slight differences from one glove to another, even between two gloves sold as a pair. Because of this small study, the glove at the scene

and the glove in the vehicle could not be eliminated as having been once sold as a pair.

Brown-gray cotton fibers were found stuck under adhesive stars on two different notes at crime scenes and on a cotton swab at a third scene. These fibers were found to be consistent with fibers comprising the brown work gloves from the scene and from the suspects' vehicle.

Questioned Documents

Notes recovered from two of the crime scenes were submitted to the Questioned Documents Unit for examination. Unit examiners determined that the same writer(s) prepared the comparably worded portions of the notes. Indented writing and other writing were observed in a manual recovered from the suspects' vehicle. This writing corresponded in wording to portions of the notes recovered from the crime scenes. Questioned documents examiners also determined that two plastic bags recovered from one of the crime scenes were similar in size, design, and manufacturing characteristics to bags found in the suspects' vehicle.

Investigative Exhibits

Structural Design Unit personnel built an exhibit that demonstrated how the car used in the shootings had been modified. A full-sized, replicated Chevy Caprice vehicle trunk duplicated the hole found in the impounded vehicle. The hole enabled the suspect to protrude a rifle barrel out from the trunk. The purpose of the exhibit was to allow an expert witness to get inside the trunk and demonstrate possible sniper and weapon positions.

Investigative and Prosecutive Graphics Unit personnel prepared digital images of the white van and white box truck that witnesses claimed to have seen at the site of several of the shootings. Four of the images were released to the media. Visual information specialists digitally surveyed and documented the shooting scenes in Virginia and Maryland, including the location of the victims, vehicles, and physical evidence. The two-

dimensional diagrams produced from this data were used in the investigation and trials. Personnel also prepared a diagram of the suspects' vehicle depicting the hole in the rear-body panel, possible positioning of the shooter in the trunk, and the location and description of evidence. They also produced an interactive time-line chart illustrating each shooting from September 5, 2003, until the suspects were arrested October 24, 2003.

In November 2003 John Allen Muhammad was found guilty on two counts of capital murder, one count of conspiracy to commit murder, and one count of the use of a firearm in the commission of a felony. He was sentenced to death.

In December 2003 in a separate trial, Lee Boyd Malvo was found guilty on two counts of capital murder and one count of using a firearm to commit a felony. He was sentenced to life in prison without the possibility of parole and fined $200,000.

Introduction to Laboratory Sections

The successful investigation and prosecution of crimes requires, in most cases, the collection, preservation, and forensic analysis of evidence. Forensic analysis of evidence is often crucial to determinations of guilt or innocence.

The FBI has one of the largest and most comprehensive forensic laboratories in the world. The forensic services of the FBI Laboratory Division are available to the following:

- FBI field offices and Legal Attachés
- U.S. attorneys, military tribunals, and other federal agencies for civil and criminal matters
- State, county, and municipal law enforcement agencies in the United States and territorial possessions for criminal matters

The Laboratory directly supports the FBI's strategic plan with the following scientific capabilities:

- Provides correct, unassailable, and timely evidentiary results and objective testimony
- Supports field office programs and operations by improving and enhancing scientific and forensic response capabilities
- Improves existing and establishes and implements new technical capabilities, databases, protocols, policies, procedures, standards, and guidelines
- Strengthens existing and establishes new liaisons, including training and burden-sharing with national and international forensic laboratory and law enforcement agencies
- Improves and expands training opportunities for the professional staff and recruits additional professional staff
- Implements internal and external reviews, including accreditation, audits, proficiency tests, and inventories
- Develops and manages internal and external research and development projects

The Laboratory is organized into Forensic Analysis and Operational Support Branches.

Oversight and leadership for each branch is provided by a Deputy Assistant Director.

Joseph A. DiZinno

The Forensic Analysis Branch is divided into the following sections:

- Forensic Analysis Section
- Scientific Analysis Section

Tod Alan Hildebrand

The Operational Support Branch is divided into the following sections:

- Forensic Science Support Section
- Operational Response Section
- Operational Support Section

Forensic Analysis Section

Cryptanalysis and Racketeering Records Unit

The Cryptanalysis and Racketeering Records Unit examines evidence relating to criminal and terrorist organizations. Records may include ledgers, notebooks, letters, coded documents, banking and real estate records, and intercepted e-mails or conversations. The data submitted for examination is typically in hard copy, but in some instances, it is stored in computers, diskettes, and electronic data organizers. The Unit is divided into four program areas:

- **Cryptanalysis**—Decrypts manual codes and ciphers found in letters, diaries, ledgers, and other types of written communications, records, and e-mails. Common users of codes and ciphers include domestic and international terrorists, foreign intelligence agents, gang members, prison inmates, and violent criminals.
- **Drugs**—Examines records relating to marijuana, cocaine, heroin, and methamphetamine drug-trafficking operations. Records may reveal the type of operation, type of drug, quantity of drug sold or purchased, unit prices, method of payment, transaction dates, roles of participants, gross and net profits, and operating expenses.
- **Racketeering**—Examines records relating to sports bookmaking, loan-sharking, prostitution, illegal lottery, video-gambling machines, and Internet gambling. Records may reveal the type of operation, dates of activity, wager amounts and types, roles of participants, operational accounting methods, and annual percentage rates.
- **Money Laundering**—Examines financial records relating to white collar and organized crime, drugs, and domestic and international terrorism matters. Records may reveal the subjects' financial and assets interests and the movement of money through financial institutions and across international borders.

Espionage Investigation

In August 2001 FBI Special Agents arrested Brian Patrick Regan at Washington Dulles International Airport as he was boarding a flight to Switzerland. Searches of Regan's baggage resulted in the discovery of several coded messages. Regan, a former Air Force intelligence analyst, was charged with three counts of attempted espionage and one count of illegally gathering national security information.

Cryptanalysis and Racketeering Records Unit examiners worked closely with other FBI National Security Agency analysts and cryptanalysts to decipher the coded messages. All but three of the messages were decrypted. The deciphered messages included secret information about weapons systems as well as locations of two Swiss banks. The discovery of additional partially coded messages on Regan's home computer led to the decryption of a series of double-enciphered letters containing offers to sell top-secret government information to Iraq and Libya.

In January 2003 a Unit examiner provided expert cryptanalysis testimony at Regan's trial in federal court in Alexandria, Virginia. Regan was convicted on the espionage counts relating to weapons systems but acquitted of charges relating to Libya. Before he could be sentenced, Regan entered into a postconviction agreement in which he accepted a life term with no chance of parole and pledged full cooperation with the government.

After the trial, Unit personnel participated in debriefing interviews with Regan. Information was gained from Regan that resulted in the decryption of the three messages that had not previously been decrypted, as well as of additional coded messages found during the course of the interview process. The decryptions led Special Agents to 19 drop-sites throughout Virginia and Maryland where more than 20,000 pages of classified documents, CD-ROMs, and videotapes were found, prompting the U.S. Attorney for the Eastern District of Virginia to refer to the case as "one of the largest espionage schemes of all time."

Firearms-Toolmarks Unit

Firearms-Toolmarks Unit examiners can determine the general condition of a firearm and whether the firearm is mechanically functional or in a condition that could contribute to an unintentional discharge. Personnel perform trigger-pull examinations and examinations to determine whether a firearm was altered to fire in the full-automatic mode. Obliterated and/or altered firearm serial numbers can sometimes be restored. Firearms can be test-fired to obtain known specimens for comparison to evidentiary ammunition components such as bullets, cartridge cases, and shotshell casings. Comparisons of suspect firearms can be made with firearms depicted in surveillance images.

Fired bullets can be examined to determine general rifling characteristics, such as caliber and physical features of the rifling impressions, and the manufacturer of the bullets. The microscopic characteristics on evidence bullets can be compared to test-fired bullets from a suspect firearm to determine whether the evidence bullet was fired from that firearm.

Unit personnel also examine cartridge cases, shotshell casings, shot pellets, rifled slugs, wadding components, and muzzle attachments.

Firing a questioned firearm and ammunition combination into test materials at known distances can duplicate patterns of gunshot residue. These patterns serve as a basis for estimating muzzle-to-garment distances.

Evidence toolmarks can be compared to test marks from recovered tools. In the absence of a questioned tool, toolmark examinations can determine the type of tool(s) that produced the toolmark and whether the toolmark is of value for comparison. Toolmark examinations also include lock and key examinations.

Fracture examinations can be conducted in order to determine whether two or more pieces of evidence were at one time joined together and subsequently broken apart.

Latent Print Units

Latent Print Unit personnel examine latent prints on evidence submitted to the Laboratory. Latent prints are impressions produced by the friction ridge skin on human fingers, palms, and soles of the feet. Unit examiners analyze and compare latent prints to known prints of individuals to make identifications or exclusions. The uniqueness, permanence, and arrangement of the friction ridges allow Unit examiners to positively match two prints and to determine whether an area of a friction ridge impression originated from one source to the exclusion of all others.

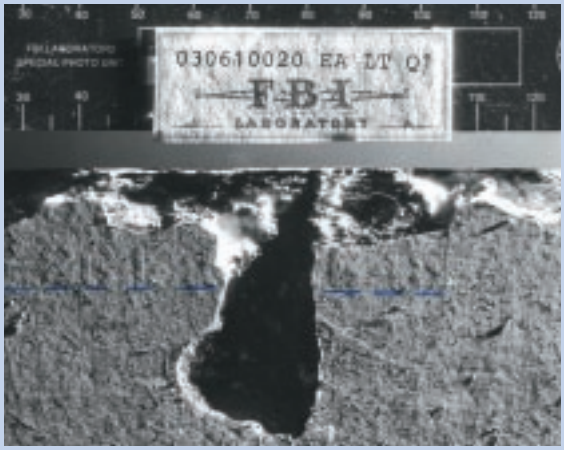
Fingerprint specialists examine crime scene evidentiary materials using chemicals, powders, lasers, and alternate-light sources to detect and develop latent prints. In instances in which a latent print has limited quality and quantity of detail,

Space Shuttle Columbia Disaster

On February 1, 2003, the Space Shuttle Columbia was minutes from landing at the Kennedy Space Center in Florida. During reentry into Earth's atmosphere, a thermal breach in the leading edge of Columbia's left wing caused a structural failure that resulted in a total breakup of the vehicle.

In order to determine the exact location of the breach, NASA conducted a failure analysis that included reassembling recovered debris items. This reconstruction would show the path taken by the hot gases as they penetrated the orbiter's skin. The skin was covered by thousands of sequentially numbered ceramic tiles that were severely damaged by the excess heat, impact, or both.

NASA requested assistance from the Firearms-Toolmarks Unit in recovering serial numbers from damaged tiles in order to more accurately place these tiles in their proper locations during the reconstruction. With the assistance of Special Photographic Unit personnel and using alternate-light-source instrumentation, Unit examiners uncovered several serial number characters that had previously been invisible to the naked eye.



Unit personnel may perform digital processing or microscopic examinations in order to make conclusive comparisons.

Unit examiners also compare latent prints with the known prints of victims and/or suspects.

FBI Disaster Squad

Latent fingerprint examiners form the nucleus of the FBI Disaster Squad. Since 1940 the Disaster Squad has responded to over 225 disasters worldwide and identified more than half the victims by fingerprints or footprints. Members of the Squad assist in printing the deceased at disaster scenes, collecting antemortem fingerprints of victims, and identifying their remains by friction ridge skin.

IAFIS

In 1999 the FBI implemented the Integrated Automated Fingerprint Identification System (IAFIS). Although IAFIS is primarily a ten-print system for searching an individual's fingerprints to determine whether a prior arrest record exists and then maintaining a criminal arrest record history, the system also offers significant latent print capabilities. Using IAFIS, a latent print examiner can digitally capture latent print and ten-print images and perform the following functions:

- Enhance image quality
- Compare latent fingerprints with suspect ten-print records from the criminal fingerprint repository
- Search latent fingerprints against the ten-print fingerprint repository when no suspects have been developed
- Automatically search new arrest ten-print records against an unsolved latent fingerprint repository
- Create special files of ten-print records to support major criminal investigations

Using the IAFIS fingerprint search capability against data from the FBI's Criminal Justice Information Services Division, which maintains the world's largest repository of fingerprint records, the Latent Print Unit personnel have made identifications in cases when no known suspects were named for comparison purposes and in cases when latent prints on crime scene-related evidence were not identified with suspects named in the investigation.

Unit personnel use special techniques to examine fingers and hands of unknown deceased individuals to obtain identifiable prints. Automated searches of identifiable prints can be conducted using the IAFIS database, which contains over 44 million criminal fingerprint records and approximately 2 million civil fingerprint records. If classifiable prints are obtained from all ten fingers, manual searches can also be conducted in the civil fingerprint file.

Questioned Documents Unit

Questioned Documents Unit personnel examine and compare data on paper and other evidentiary materials. Included are examinations of handwriting, hand printing, typewriting, printing, erasures, alterations, and obliterations. Impressions in the surface of paper, such as those from indented writing or use of a check writer or dry seal, are also evaluated by Unit examiners, as are shoeprint and tire tread impressions.

In addition to data contained on the surface of documentary evidence, data within paper or other surfaces, including watermarks, safety fibers, and other integral features, may be components of document examinations.

Unit examiners also match torn or perforated edges of items such as paper, stamps, or matches. Other Unit examinations include analyses of typewriter ribbons, photocopiers, facsimiles, graphic arts, and plastic bags.

The Unit also maintains databases, including the Anonymous Letter File, Bank Robbery Note File, National Fraudulent Check File, Watermark File, and Shoeprint File.

Chem-Bio Sciences Unit

Chem-Bio Sciences Unit personnel develop and maintain the FBI's ability to provide high-quality forensic examinations of hazardous chemical, biological, and nuclear materials and related evidence by:

- Providing analysis to detect traces of chemical, biological, or nuclear materials to support the prevention, investigation, and prosecution of terrorist activities
- Providing forensic examinations of hazardous materials and conventional evidence contaminated with these materials
- Ensuring that forensic analysis of hazardous materials and conventional evidence contaminated with these materials is represented by expert courtroom testimony and defensible scientific analysis

The Unit's mission includes the following challenges:

- Technical personnel with specialized training must process evidence that is extremely dangerous in costly safety facilities.
- Hazardous materials encompass a complex and broad range of science and technology, including chemistry, microbiology, biochemistry, and physics.
- Conventional evidence, such as fingerprints, materials, devices, toolmarks, and trace evidence, that has been contaminated with hazardous materials must be exploited.
- Examinations must be performed under high quality assurance and control standards.

To augment the Laboratory's capabilities, the Unit is coordinating the resources of federal and private laboratories that are capable of handling, processing, and analyzing chemical, biological, and radiological terrorism evidence. Unit personnel are pursuing cooperative laboratory initiatives with the U.S. Department of Homeland Security. The Unit also has agreements with the following laboratories:

- Edgewood Chemical/Biological Forensic Analytical Center, Edgewood area, Maryland

- U.S. Army Military Research Institute of Infectious Diseases, Fort Detrick, Maryland
- Savannah River Technical Center, U.S. Department of Energy, Savannah River site, South Carolina
- Naval Medical Research Center, Silver Spring, Maryland
- Lawrence Livermore National Laboratory, Livermore, California

Unit personnel are exploiting advances in biotechnology that promise highly specific identification of disease-causing organisms by examining their DNA. Much work remains to be done in this area, and the Unit is building Laboratory resources to develop new "bioforensics" methods. Chem-Bio Sciences Unit personnel will establish standardized, validated procedures and train Laboratory examiners in chemical, biological, and radiological safety. This will allow the Laboratory to employ its well-developed conventional forensics resources to examine hazardous evidence.

Chemistry Unit

The Chemistry Unit is divided into the following program areas:

- **General Chemistry**—Conducts chemical characterizations of unknown solids or liquids. Chemists identify specific dyes and chemicals used in bank security devices and analyze items such as clothing or currency for the presence of these dyes and chemicals. Personnel compare stains or markings to suspected sources, detect the presence of lubricants and compare to suspected sources, and compare the formulations of known and questioned ink (e.g., pens, typewriters, stamp pads). Chemists determine pharmaceutical identification of constituent composition, active ingredients, quantity, and weight. Unit personnel also analyze controlled substances to determine identity and quantity.
- **Toxicology**—Conducts toxicological analyses of biological specimens or food products for drugs, drug metabolites, and poisons and investigates claims of product tampering.
- **Paints and Polymers**—Analyzes paint chips for comparison to suspected sources. Personnel determine automotive make, model, and year from suspected paint samples and maintain the National Automotive Paint File. Scientists compare plastics to suspected sources. Personnel determine tape composition, construction, and color for comparison to suspected sources and determine the manufacturer of suspected adhesive tape, make tape identifications with the torn or cut end of the tape and a roll of suspected tape, and maintain the National Forensic Tape File. Caulks, sealants, and adhesives can be compared by color and composition to suspected sources.
- **Metallurgy**—Performs examinations on evidence from air, rail, and maritime disasters. Damage and failure analyses, strength-of-materials issues, specifications fraud, fabrication evaluation, corrosion assessment, product tampering, sabotage, and appliance and device functionality examinations are performed in the Unit.
- **Elemental**—Examinations of bullet lead, arsenic in biological specimens, glass composition, lamp bulbs, speedometers, stabbing instruments, and materials comparisons associated with homicide, arson, and accident investigations are performed.
- **Instrumentation Operation and Support**—Calibrates and maintains analytical instruments, evaluates new technology, and maintains the Unit instrument database and archived data.

Mother's Day Poisoning

Hemoutie "Geeta" Raghunauth's last meal was a special lunch prepared and served by her husband, Ganesh, on Mother's Day 2000 in a suburb of Toronto, Canada. Within hours of the meal, Geeta and her unborn child were dead. Initially investigators thought that her death was a suicide because toxicological analyses of autopsy samples performed by the Centre of Forensic Services in Toronto and the FBI Laboratory's Chemistry Unit found large doses of temazepam, a sedative drug, and cyanide. But as the investigation progressed, investigators theorized that Ganesh staged a suicide by sedating Geeta with temazepam-spiked food and then force-feeding her cyanide.

Prior to his wife's death, Mr. Raghunauth collected information from coworkers and the Internet about cyanide and medical procedures. He also asked a friend to get him some cyanide to "get rid of a skunk problem." Furthermore, Mr. Raghunauth was having an affair, and the couple became engaged three weeks prior to Geeta's death.

Chemistry Unit personnel performed many of the toxicological analyses on the evidence from this case. In April 2003 an examiner from the Chemistry Unit provided expert testimony at the trial of Ganesh Raghunauth by explaining the results of the toxicological analyses and offering expert opinion regarding the results.

In June 2003 a jury found Ganesh Raghunauth guilty of first-degree murder. He received a mandatory life sentence and will not be eligible for parole for 25 years.

Anthrax Threat Letters

In November 2003 Clayton Lee Waagner was tried in Philadelphia, Pennsylvania, for sending threat letters allegedly containing anthrax to abortion clinics across the country.

Two and a half years earlier, Waagner escaped from custody while awaiting sentencing on federal firearms charges. After a series of bank robberies and carjackings, Waagner initiated a campaign of mass mailings to abortion clinics in the fall of 2001. All of the approximately 500 letters sent claimed that the recipient had just been exposed to high levels of anthrax. The alarm generated was severe because the letters followed closely on the mailing of deadly anthrax powders a few weeks earlier in Florida, New York, New Jersey, and Washington, DC.

After Waagner's arrest in December 2001 in Cincinnati, Ohio, the letters, envelopes and the powders in the envelopes, and other items of evidence were submitted to the Laboratory for examination. Fingerprints from Waagner were identified on threat letters that he had left with antiabortion activist Neal Horsley during a visit to Horsley's residence. Comparisons conducted by the Questioned Documents Unit showed that letters sent out during the mass mailings matched one of the letters recovered from Horsley. The powders analyzed in the Chemistry Unit were shown to be consistent with flour or chalk dust. The Centers for Disease Control and Prevention, which had already verified that the powders were negative for anthrax, determined that the chalk dust powders contained a bacillus used as an insecticide.

During Waagner's two-week trial (at which he acted as his own attorney), a Laboratory latent print examiner established a physical connection between Waagner and the threat letters, and a Laboratory chemist testified regarding the chemical and biological analysis of the powders.

The jury found Waagner guilty on 51 of the 53 counts charged in the indictment, including threatening to send a weapon of mass destruction. He faces a maximum possible sentence of life imprisonment.

CODIS Unit

The Unit manages the Combined DNA Index System (CODIS). CODIS blends forensic science and computer technology into a tool for linking violent crimes. It enables federal, state, and local forensic laboratories to exchange and compare DNA profiles electronically, thereby linking serial violent crimes to each other and to known offenders.

The highest level in the CODIS hierarchy is the National DNA Index System (NDIS). There are 161 NDIS participating sites consisting of 110 local DNA index systems and 51 state DNA index systems.

Using two indexes, CODIS generates investigative leads in crimes where biological evidence is recovered from the crime scene. The forensic index contains DNA profiles from crime scene evidence, and the convicted offender index contains DNA profiles of individuals convicted of felony sex offenses and other crimes. An index for DNA from missing persons has been added to CODIS, allowing federal, state, and local law enforcement laboratories to identify missing persons and recovered human remains.

Accomplishments as of October 2003

Convicted Offender Samples in NDIS	1,566,552
Forensic Samples in NDIS	75,394
Missing Persons	94
Forensic Hits	2,787
Offender Hits	7,630*
Investigations Aided	10,358
Laboratories	175
NDIS Participating Sites	161

*Note: *6,608 at State DNA Index System; 1,022 at NDIS*

DNA Analysis Units

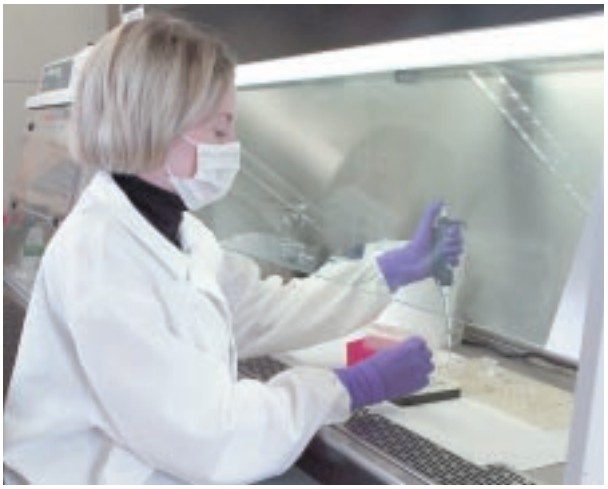
Deoxyribonucleic acid (DNA) is analyzed in body fluids, stains, and other biological tissues recovered from evidence. The results of DNA analysis of questioned biological samples are compared with the results of DNA analysis of known samples. This analysis can associate victim(s) and/or suspect(s) with each other or with a crime scene.

Two sources of DNA are used in forensic analyses. Nuclear DNA (nDNA) is typically analyzed in evidence containing blood, semen, saliva, body tissues, and hair that have tissue at their root ends. Mitochondrial DNA (mtDNA) is typically analyzed in evidence containing naturally shed hair, hair fragments, bones, and teeth.

DNA Analysis Unit 1 examiners and biologists analyze body fluids, body fluid stains, clothing, envelopes, and other types of evidence recovered in violent crimes, counterterrorism efforts, and other investigations. Examinations include identifying and characterizing blood and semen using traditional serological techniques, as well as sampling items of evidence where biological material may have been deposited (e.g., envelope flaps, masks, gloves). When a stain is identified or a sample is collected, it is characterized by DNA analysis using short tandem repeats, a polymerase chain reaction-based technique. The results of the analyses are compared to results obtained from known blood and/or saliva samples submitted from the victims and/or suspects.

DNA Analysis Unit 1 personnel manage the Federal Convicted Offender Program. Unit biologists process reference samples to add to NDIS of CODIS for searching and comparison with convicted offender profiles and other crime scene samples. In addition, Unit personnel generate nDNA profiles on unidentified remains, missing persons, and relatives of missing persons to contribute to the National Missing Persons Database.

Scientists in DNA Analysis Unit 2 use mtDNA analysis that is applied to evidence containing small or degraded quantities of DNA from hair, bones, and teeth. The results of the analysis are compared to blood and/or saliva submitted from the victims and/or suspects. The Unit examines evidence that prior to developing this technique may not have been suitable for significant comparison purposes using nDNA analysis. The Unit also manages the National Missing Persons Database. This program analyzes DNA samples from unidentified human remains and from relatives of missing persons. The results are entered into the Missing Persons Indexes of CODIS.



Four Regional mtDNA Laboratories Selected

Regional mtDNA laboratories will partner with the Laboratory to augment the Bureau's capacity for no-cost mtDNA analysis in forensic and missing persons cases. As the partner laboratories become operational during the next two years, the Laboratory's capacity to deliver no-cost mtDNA analysis to the criminal justice system will double. Cases will be submitted directly to regional mtDNA laboratories.

In May 2003 the Laboratory notified forensic laboratories participating in CODIS of plans to competitively select partner laboratories. In June 2003 a briefing was held in Arlington, Virginia, and approximately 35 state and local crime laboratories sent representatives or requested materials. Twelve applications were received. Selected laboratories share the following traits: They are statewide, full-service forensic laboratories, and they are accredited in DNA and trace evidence with established nDNA and CODIS programs.

On September 30, 2003, the FBI awarded multiyear, cooperative agreements to the following agencies:

- Arizona Department of Public Safety, Phoenix, Arizona
- Connecticut State Police, Meriden, Connecticut
- Minnesota Bureau of Criminal Apprehension, St. Paul, Minnesota
- New Jersey State Police, Trenton, New Jersey

The agreements provide for the Laboratory to train and equip regional mtDNA laboratories and authorize casework that meets FBI quality standards. Partner laboratories will be responsible for mtDNA analysis, reporting results, and testifying, if necessary.

The Laboratory is building long-term partnerships with state and local forensic laboratories to provide critical forensic services that it cannot provide by itself. The initial term of agreement is three years but may be renewed indefinitely for two-year periods. All partner laboratories should be fully operational by September 2005, although some capacity may be available sooner.

Sexual Assaults in Houston, Texas

A series of sexual assaults involving juvenile victims occurred in Houston, Texas, during the latter part of 2003. Authorities believed the attacks were serially related, with imminent potential of another assault. The FBI's Houston Office delivered evidence related to these investigations to the Laboratory on the evening of November 6, 2003. DNA Analysis Unit 1 personnel took custody of and inventoried the evidence. They conducted serological examinations throughout the night, identifying semen in two cases. The examination team then worked diligently for 18 hours processing samples for DNA analysis.

By the early morning hours of November 8, 2003, DNA-typing results were obtained. The DNA information unexpectedly demonstrated that the sources of semen in each case were different individuals, ruling out the possibility of a serial attacker. The DNA profiles from each case were searched in NDIS, and two previously convicted offenders were identified as the semen sources of the DNA in each case.

On the basis of this information, local law enforcement, in conjunction with FBI officials, was able to quickly locate and apprehend both subjects.

Murdered Child

On August 13, 1998, 11-year-old Angelica Padilla disappeared while delivering newspapers in Willimantic, Connecticut. Seven hours later, her partially clad body was found in the woods behind her apartment building. She had been hit in the head with a blunt object and her throat slit so severely she was nearly decapitated. Jose Torres, who also lived in the apartment building, was accused of killing Angelica.

The Connecticut State Police Forensic Laboratory found a semen stain too small for conventional nDNA testing on the victim's shorts. An extract of the stain was sent to the FBI Laboratory for mtDNA testing. The mtDNA type matched that of Torres.

A DNA Analysis Unit 1 examiner testified in Connecticut Superior Court regarding this evidence in February 2002. On March 11, 2002, Torres was found guilty on capital felony and murder charges and sentenced to life in prison without possibility of parole.

Skeletal Remains Identified

Russell Jordan was 16 years old in 1982 when he was last seen alive. In 1995 skeletal remains were discovered by a Los Gatos resident who was walking his dogs along a hiking trail in Novitiate Park in California. The head and hands were missing from the recovered remains. Items found with the body, particularly a belt buckle with a Schlitz beer insignia, led the Los Gatos-Monte Sereno Police Department to think that the remains were those of Russell Jordan.

A portion of the recovered remains was sent to the FBI Laboratory's National Missing Persons DNA Database program. The bones were processed numerous times without suitable results. Scientists from the Laboratory's Counterterrorism and Forensic Science Research Unit worked with personnel from the National Missing Persons DNA Database program to develop a DNA extraction protocol that would increase the amount of DNA that could be extracted from bones. In late 2002 research on and validation of the improved bone extraction protocol was complete.

The Russell Jordan case was reexamined, and the bones yielded enough DNA for an mtDNA comparison. The mtDNA profile from the recovered remains was compared to the mtDNA profile from Russell Jordan's mother. The profiles were the same.

On December 18, 2003, Sean Clark Viehweg, Russell Jordan's high school classmate, plead no contest to voluntary manslaughter. He will be eligible for release in two years.

Explosives Unit

Explosives Unit personnel examine evidence resulting from an apparent explosion and/or recovery of an explosive device. Examinations are based on the premise that components and accessories used to construct the devices survive the explosion, although disfigured. The examinations can accomplish the following:

- Identify the components used to construct the device, such as switches, batteries, detonators, tapes, wires, and fuzing systems
- Identify the explosive main charge
- Determine the construction characteristics
- Determine how the device functioned or was designed or intended to function
- Determine the specific assembly techniques employed by the builder(s) of the device
- Preserve the trace evidence potentially present in the devices so it is not destroyed or damaged during the examinations

Unit personnel also provide field support and perform bombing crime scene investigations. They search bomb-making factories and safe houses where bombs or bomb components may be encountered. Explosives Unit personnel manage the Terrorist Explosive Device Analytical Center.

Terrorist Explosive Device Analytical Center

Since September 11, 2001, the FBI's primary mission has been to prevent further acts of terrorism against U.S. citizens and interests, at home and abroad. FBI assets dedicated to investigating terrorism have more than doubled in the past two years. Joint terrorism task forces are now operational in every FBI field office. Dozens of FBI Special Agents and analysts have been deployed overseas to work closely with U.S. military and foreign intelligence to obtain information about terrorists before they strike.

The Laboratory is developing the Terrorist Explosive Device Analytical Center (TEDAC) to forensically exploit and disseminate intelligence on improvised explosive devices used by terrorists. According to a recent U.S. Department of State report, more than 85 percent of all terrorist attacks against U.S. interests and citizens during the past five years involved improvised explosive devices, also known as homemade bombs. Unlike manufactured military ordnance, these bombs often reflect the unique characteristics or signature of the terrorist organizations or individuals making them. It is intelligence of this nature that may help identify terrorists before they strike American targets.

TEDAC is a multiagency effort that serves as the primary center for improvised explosive device-related information and provides joint recommendations for improvised explosive device disposal methods. TEDAC is establishing relationships among agencies to foster the best data collection, maintenance, and database sharing. Current TEDAC partners include the Bureau of Alcohol, Tobacco, Firearms and Explosives; Central Intelligence Agency; National Security Agency; Defense Intelligence Agency; Naval Explosive Ordnance Disposal Technology Division; National Ground Intelligence Center; and military commands. In addition, TEDAC includes British military, law enforcement, and intelligence agencies.

TEDAC's primary mission is to exploit the terrorist reliance on improvised explosive devices for offensive and defensive intelligence, technical, and tactical use. This will be accomplished through communication, forensic analysis, and the fusion of resources.

Pipe Bomb in Santa Ana, California

On June 15, 2003, Hai Duc Le was in his 1990 Toyota Cressida in Santa Ana, California, when a bomb exploded in his car. Le was seriously injured and taken to a hospital. Explosives Unit personnel examined the crime scene and found remnants of a PVC pipe bomb that had split into two pieces, with an apparent low-explosive filler. The endcaps had been attached with double-sided tape. Roofing nails, pipe pieces, and filler were found inside and outside the car. A remotely controlled transmitter and receiver were also recovered. Le's wallet contained receipts for the purchase of pipe, endcaps, and other items.

An interview with Le's brother led to the discovery in the brother's car of three bottles of Pyrodex (a propellant for use in muzzle loading and black powder cartridge arms), a purchase receipt for them, nails, and screws. A search of Hai's residence led to the discovery of other items, including correspondence between Hai and a U.S. Congresswoman about a relative's immigration matter. Although Hai's vehicle was parked in a strip mall where the Congresswoman's satellite office is located when the device functioned, it is not known if she was the intended victim. A nearby Vietnamese cafe could also have been the target.

Hai Duc Le was charged with using a weapon of mass destruction. He was also charged with carrying and using a destructive device, attempted arson, possession of an unregistered firearm (i.e., a pipe bomb), and the illegal making of a destructive device. His brother, Hien Duc Le, was charged as an accessory after the fact and with obstructing justice for allegedly concealing evidence. Hai Duc Le could be sentenced to 35 years to life in prison.

Trace Evidence Unit

The Trace Evidence Unit identifies and compares specific types of trace materials that could be transferred during a violent crime. These trace materials include human and animal hair, textile fibers and fabrics, ropes and cords, soil, glass, building materials, feathers, and wood. Physical anthropology (skeletal remains) examinations, coordinated with the Smithsonian Institution, are also performed to help identify human remains and assist in determining possible cause of death.

The physical contact between a suspect and a victim can result in the transfer of trace materials such as hair, fibers, soil, and glass. The identification and comparison of these materials can often link a suspect to a crime scene or to physical contact with another individual. Torn pieces of fabric can be positively associated to a damaged garment, and broken pieces of wood or glass can be positively fitted together.

The Unit maintains reference collections of human and animal hair, natural and man-made textile fibers, fabrics, feathers, soil, and wood.

Forensic Science Support Section

Counterterrorism and Forensic Science Research Unit

The Counterterrorism and Forensic Science Research Unit researches, develops, and delivers new technologies and methodologies to advance forensic science and fight terrorism. The Unit also manages the Research Partner Program, Visiting Scientist Program, and Specialized Forensic Science Training Program, which are described in the Laboratory Outreach Programs section.

Unit scientists are responsible for research and development, validation studies, and transferring new forensic procedures and protocols to Laboratory caseworking units. They also publish results of completed research projects in peer-reviewed scientific journals, present findings at scientific meetings, and provide advanced technical training in formal classes and training symposia. Unit scientists provide expert advice and guidance to state and local law enforcement agencies.

Through outsourced and internal research and development, Unit personnel executed more than 100 projects in 2003, including 51 in biological sciences, 22 in chemical sciences, and 36 in physical sciences. The Unit is divided into three areas:

- **Biology**—Unit scientists initiated a major project to automate forensic DNA analysis. This research will help eliminate the backlog of convicted offender samples to be added to CODIS and will benefit the Laboratory's caseworking units as well as forensic laboratories across the country. Although each step in the process will be addressed separately, the outcome of this project will be an integrated system for "hands-off" analysis. Efforts also continue to streamline mtDNA analysis, including evaluating and validating a faster method for postamplification DNA quantitation.
- **Chemistry**—The chemical sciences group has expertise in separations, mass spectrometry, and portable instrumentation for field use. An isotope ratio monitoring mass spectrometry program was introduced in 2003 to compare otherwise indistinguishable forensic samples. Other efforts of this group range from the development of a new explosives analyzer that combines screening and confirmation in a single analysis to the implementation of a new protocol to colorimetrically determine the presence of invisible pepper spray residue on clothing.

- **Physical Sciences**—Materials analysis, molecular spectroscopy, imaging, and latent fingerprint and document examinations are specialties in physical sciences. A major effort of this group is the hyperspectral imaging of questioned documents and obliterated handwriting in order to provide spectrochemical analysis. In addition, a precise aiming mechanism was developed for an explosive device disrupter, and statistical analysis of fingerprint uniqueness is nearing completion this year.

Evidence Control Unit

All evidence administrative management and tracking from receipt to disposition was shifted from Laboratory examiners to the Evidence Control Unit in 2003. Examiners are now able to analyze evidence full time without the burden of administrative functions of evidence processing.

Early in 2004 Unit personnel will integrate the Laboratory Information Management System (LIMS), an automated evidence-tracking system. LIMS will provide a paperless process for evidence tracking, quality and inventory control, casework documentation, and direct administrative reporting.

Unit personnel also provide evidence management leadership and training to FBI evidence technicians and examiners as well as to federal, state, and local law enforcement agency personnel by establishing policy for evidence receipt, handling, packaging, transfer, and storage. The Unit's goal of restructuring evidence management will provide quality and efficient customer service to the forensic science and law enforcement community through active liaison, communication, and leadership.

Quality Assurance and Training Unit

The Quality Assurance and Training Unit manages the following functions:

- Develops and maintains quality assurance practice standards, general guidelines for standard operating protocols, and the quality assurance manual
- Develops, coordinates, and reviews quality assurance programs, including calibrating and maintaining instruments and equipment and the proficiency testing program, which includes internal and external testing
- Performs quality audits to verify for managers that established quality policies and programs are being followed
- Coordinates and manages the accreditation program
- Coordinates and implements the quality assurance training programs

The Laboratory Library supplies forensic science information to FBI and national and international scientists and examiners. The information supports evidentiary examinations, prepares examiners for courtroom testimony, and facilitates research and development to further forensic science knowledge, techniques, and instrumentation.

The Library staff publishes *Forensic Science Communications,* a quarterly, online, peer-reviewed forensic science journal. The journal is a means of communication among international forensic scientists and may be viewed at www.fbi.gov/hq/lab/fsc/current/index.htm.

The Library staff also publishes the *Handbook of Forensic Services,* a set of guidelines and procedures for collecting, preserving, packaging, and shipping evidence. The *Handbook* describes the forensic examinations performed by the Laboratory and may be viewed at www.fbi.gov/hq/lab/handbook/intro.htm.

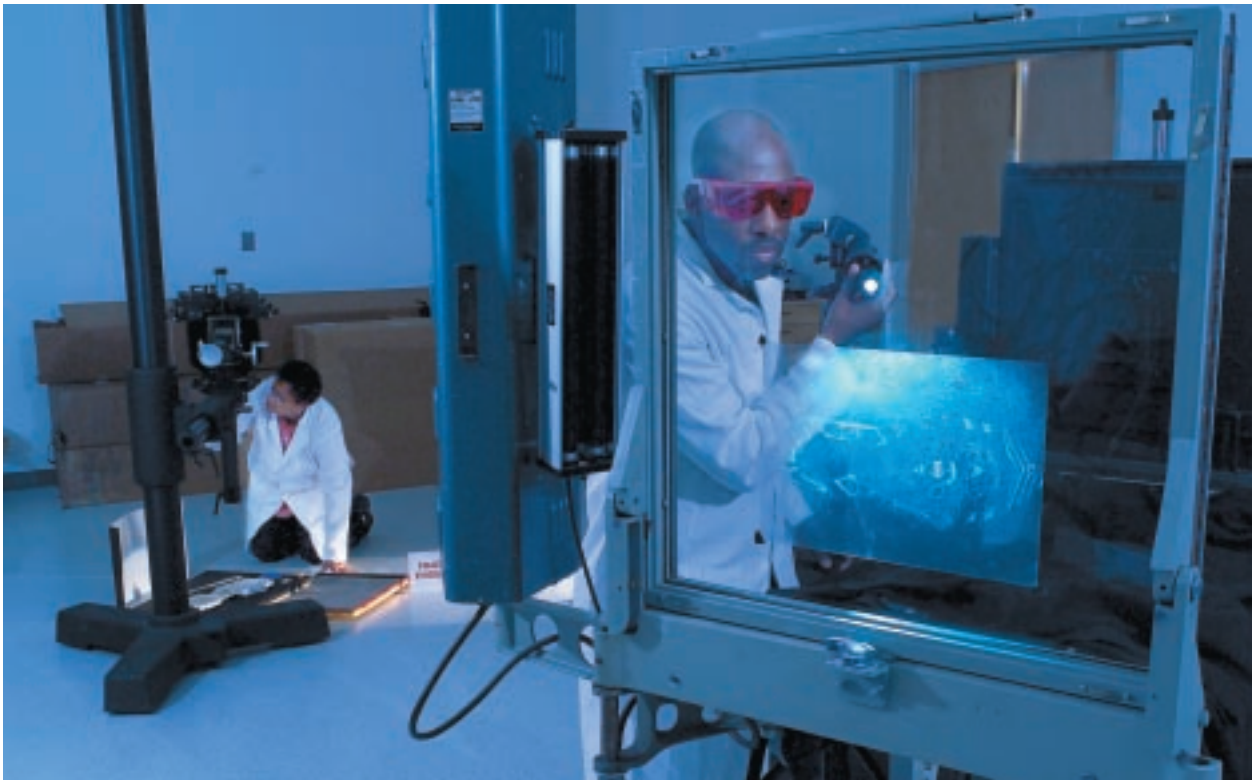
Unit personnel coordinate forensic science course development and training for new Special Agents and National Academy students. They also ensure that standards are met for on-the-job training of Laboratory examiners and technicians. The Unit

organizes the annual Symposium on Crime Laboratory Development for state and local forensic laboratory managers.

Special Photographic Unit

The Special Photographic Unit is the FBI's primary imaging operation and provides operational, investigative, and forensic photography, including surveillance photography and concealment installations, technical assistance, camera equipment repair, and camera and darkroom equipment procurement. Unit personnel capture, process, and produce photographic images using traditional silver-based photographic processes and digital-imaging technologies. The Unit is divided into three subunits:

- **Forensic Studio**—Provides photographic support and services to the FBI. The support includes forensic, crime scene, evidentiary, special-event, venue, direct vertical, and oblique-aerial photography, including vertical-aerial mapping. Photographers go to major crime scenes, shootings involving Special Agents, and other operational and investigative photographic assignments.
- **Field Support**—Processes film and produces hard-copy photographs, including enlargements for court presentations. Personnel install equipment in regional minilaboratories, provide the supplies to manage the laboratories, and train field photographers to operate the equipment. The subunit is responsible for the digital darkroom program, which includes purchasing, repairing, installing, and training. Personnel design and install photographic concealments. They are also responsible for procuring new camera equipment, repairing existing photographic equipment, and helping field offices with newly adopted photographic equipment.
- **Training**—Provides six hours of basic and crime scene photography training to new FBI Special Agents. Unit specialists teach the following classes to Special Agents and field support personnel: Basic, Intermediate, Crime Scene, Surveillance, and Digital Photography. The Unit also trains police agency personnel in Police Photography, Forensic Photography I, and Forensic Photography II.



Bomb Data Center

Bomb Data Center specialists develop techniques, technology, and equipment that minimize the hazards associated with bomb disposal. The Center administers the Hazardous Devices School, which trains and certifies public-safety personnel in render-safe technology for explosive devices. Center personnel serve as a liaison between the law enforcement and intelligence communities to ensure rapid and accurate notification of threat situations and trend analysis in bombing incidents. The Center provides on-site technical support to public-safety bomb squads upon request and administers the FBI's Special Agent bomb technician program. The Center provides training and selects, procures, and distributes specialized equipment to public-safety bomb squads responding to chemical, biological, and radiological weapons of mass destruction threats.

Bomb Data Center personnel publish an annual statistical summary and the following publications: *General Information Bulletin, Investigator's Bulletin,* and *Special Technician's Bulletin.* They also produce additional bulletins and intelligence summaries upon request or to highlight new or unusual hazardous devices. Last year the Center published 31 bulletins and other summaries.

Hazardous Devices School

The groundbreaking ceremony for the new Hazardous Devices School was held October 28, 2002. The $25 million project is being funded by the FBI to enhance state and local bomb squads' ability to respond to a weapons of mass destruction incident. The school will include 3 administrative and classroom buildings and 14 practical-exercise training villages. The new facility is located on 295 additional acres near the existing Hazardous Devices School at the Redstone Arsenal in Huntsville, Alabama. The project is scheduled to be completed by September 2004. The new facility will improve the Hazardous Devices School's ability to meet the needs of the 451 accredited bomb squads in the United States.

The existing school has been at the Redstone Arsenal since 1971 and provides basic and recertification courses for 2,600 public-safety bomb technicians in the United States. The school also offers specialty courses for bomb squad personnel, including a Robot Course, an Advanced Access and Disablement Course, and an Executive Management Course for managers who are not bomb technicians. The Hazardous Devices School also teaches an Explosives Handlers Certification Course for FBI personnel who are not bomb technicians but who need to handle explosives.

Every summer Special Agent Bomb Technician Annual Training is held at the Hazardous Devices School. In addition, the Bomb Data Center sponsors field training for Special Agent bomb technicians and state and local bomb squads.

- One-week Regional Technicians Seminars are taught ten times a year by Bomb Data Center personnel, field Special Agent bomb technicians, and Hazardous Devices School instructors at locations selected by host FBI field offices. These seminars provide sustained and specialized training in new techniques, procedures, and equipment.
- Field office Postblast Seminars are taught by the field office's Special Agent bomb technician. Center personnel provide technical support, instructional materials, and explosives. The five-day programs are designed to train state and local police, task force members, and FBI Special Agents in basic postblast crime scenes. Special Agent bomb technicians also provide recognition training in explosives and explosive devices.
- Explosive Device Recognition and X-Ray Interpretation is taught to FBI mailroom and tour route personnel and to police officers assigned to FBI Headquarters, the Washington Field Office, and FBI facilities in Quantico, Virginia.
- Bomb Data Center personnel teach specialized, unique courses to meet specific needs. The Large Vehicle Bomb Counter Measures Course has been incorporated into the regional training seminar schedule. A Practical Applications Course is being planned for the Colombian National Police bomb squad personnel during 2004.

Evidence Response Team Unit

The Evidence Response Team Unit supervises and coordinates Evidence Response Teams (ERTs) throughout the FBI. ERTs are groups of well-trained and well-equipped Special Agent and support personnel who specialize in organizing and conducting major evidence-recovery operations and crisis sites. These personnel respond to complex searches and major crisis sites with the most current techniques, procedures, and equipment to ensure that critical evidence is identified and gathered for forensic analysis. Each ERT typically consists of a team leader and seven members who have specific responsibilities. The team may include a photographer, sketch preparer, evidence log recorder, evidence custodian, evidence collector/processor, and specialists such as bomb technicians and forensic anthropologists. ERTs are structured primarily for

FBI casework but can also provide forensic support to other agencies when authorized.

In overseeing the ERT program, the Unit assists FBI field offices in organizing, operating, training, providing logistical support, and funding ERTs. The Unit also researches equipment and techniques to ensure that ERTs are conducting searches in a safe, efficient, and professional manner.

In addition, the Unit conducts forensic science training for all FBI Special Agent classes and for national and international law enforcement managers attending the FBI National Academy.

Evidence collection and documentation have become more sophisticated. ERTs handle crime scenes and complex searches and must stay abreast of forensic technological advances. In order to meet this challenge, the Evidence Response Team Unit provides and coordinates basic and advanced training for all ERT personnel in FBI field offices.

The Unit provides a two-week Basic Evidence Response Team Course for all new ERT members. In 2003 Unit personnel taught eight basic courses to more than 200 ERT members.

After the basic course, team members may take advanced courses designed to address specific situations commonly encountered by ERTs. During 2003 more than 650 team members received advanced training. Examples of advanced courses are:

- The Postblast Crime Scene Course teaches students to manage bombing crime scenes and collect improvised explosive devices components.
- The Explosives Unit and Hazardous Materials Response Unit assist the Evidence Response Team Unit with a Mass Disaster Course. The course simulates bombing crime scenes complicated by the presence of tissue fragments from victims.
- The Forensic Anthropology Course is held annually at the University of Tennessee. Students gain experience in recovering human remains at the University's Anthropology Center, known as the Body Farm.
- San Diego Regional Computer Forensics Laboratory personnel assist the Evidence Response Team Unit with a Digital Evidence Collection Course that teaches students how to properly recover stored data from computers, facsimile machines, personal digital assistants, pagers, and cellular telephones.
- Specialists from the Latent Print Units teach the Advanced Latent Print Course. Students are taught to locate, document, and recover latent fingerprints, which are often present at crime scenes. Field office ERT photographers assist with this course.
- Coordinated with the Evidence Response Team Unit, the Shooting Trajectory Course is presented by personnel from the Firearms-Toolmarks Unit.

Underwater Search and Evidence Recovery Teams

The Evidence Response Team Unit, in conjunction with the New York Office, initiated in 2003 four additional underwater search teams, with a fifth team to be fully operational in 2004. These teams are trained in ice, cave, and wreck diving in order to conduct forensic searches and retrieve evidence.

Technology-Assisted Search Teams

The Evidence Response Team Unit maintains equipment and specialized personnel to conduct searches for evidence buried underground and beneath hard surfaces. The Technology-Assisted Search Team is available to respond to an FBI field office request or to assist foreign countries upon request from the Legal Attaché.

Columbia Space Shuttle Disaster

On February 1, 2003, ERTs from the FBI's Dallas, Houston, San Antonio, and New Orleans Offices and members of the Laboratory's Evidence Response Team Unit responded to the Columbia Space Shuttle crash site. ERT members developed protocols for collecting and inventorying recovered items that were adopted by the federal, state, and local agencies also responding to the disaster. The ERTs were responsible for locating, securing, documenting, and assuming custody of human remains. The teams were further tasked with locating, documenting, and collecting sensitive cargo and components of the shuttle.

The Evidence Response Team Unit's Underwater Search and Evidence Response Team from the New York Office also responded to the disaster site, implementing a plan for the underwater recovery of shuttle debris. The Underwater Search and Evidence Response Team deployed its side-scan sonar and remotely operated vehicle to mark targets to be explored. The members conducted numerous dives over a ten-day period. These dives led to the recovery of significant components of the Space Shuttle Columbia.

ERTs across the country, from Pennsylvania to Arizona, were also involved in collecting potential shuttle debris.

Riyadh, Saudi Arabia, Bombings

On May 12, 2003, vehicle bombs were detonated in three residential compounds—Eshbiliya, Al-Hamra, and Vinnell—occupied by westerners in Riyadh, Saudi Arabia. Nine Americans were among the twenty-three people killed.

The Laboratory's Explosives Unit and Evidence Response Team Unit and the Washington Field Office's ERT traveled to Riyadh to investigate the crime scenes. FBI personnel conducted line searches and collected bombing vehicle parts, weapons, ammunition, and human remains from the bombing scenes.

Hazardous Materials Response Unit

The Hazardous Materials Response Unit was established to counter the threat of terrorism involving chemical, biological, radiological, and nuclear materials and to handle an expanding caseload of environmental crimes. The Unit leads an integrated effort involving specialized response teams, a national training program, interagency liaison, technical assistance to FBI field and Headquarters offices, and the development of field-response programs. The Unit also trains, equips, and certifies FBI field office personnel for hazardous materials operations.

There are currently 19 hazardous materials response teams operating in the larger FBI field offices that are supported by the Hazardous Materials Response Unit training program. These teams are composed of more than 230 response personnel, predominantly FBI Special Agents, who require response equipment, medical monitoring, and 240 hours of specialized training. The Unit also provides training to personnel in other field offices to increase the total number of hazardous materials response teams.

Training courses currently provided to hazardous materials response teams include Hazardous Materials Operations, Weapons of Mass Destruction, Crime Scene Technician, Biology of Hazardous Materials, Chemistry of Hazardous Materials, and radiological courses. Unit personnel are also developing new course curricula: Hazardous Materials Team Leader Management, OSHA Recertification, and Radiological Dispersal Device Crime Scene.

The Hazardous Materials Response Unit assists the FBI's International Training and Assistance Unit in providing weapons of mass destruction counterproliferation training. In 2003 Unit personnel taught 11 weapons of mass destruction courses in Estonia, Latvia, Slovenia, and Romania.

The Hazardous Materials Response Unit provides guidance and support to the U.S. Department of Justice's Office for State and Local Domestic Preparedness Support and the FBI's Weapons of Mass Destruction Operations Unit. The Unit also provides technical instruction and support to the tactical training and operations of the FBI's Critical Incident Response Group for Weapons of Mass Destruction, which includes SWAT (special weapons and tactics) teams, hostage rescue teams, and bomb technicians.

Operational Support Section

Administrative Unit

The Administrative Unit's responsibilities include overseeing, coordinating, facilitating, and ensuring compliance with FBI and Laboratory policies, procedures, and guidelines governing the security program and other administrative and asset-management matters.

The following highlights the Unit's support and services:

- Ensures compliance with security issues involving personnel, facilities, communications, information, operations, classification, and confidential-trash disposal
- Manages personnel issues, including funded-staffing levels; position vacancies; postings; promotions; reassignments; performance plans and appraisals; awards; and the equal employment opportunity, employee assistance, and internship programs
- Manages the mail and messenger services, including receiving and shipping packages and mail
- Oversees the operation and assignment of approximately 150 vehicles
- Ensures compliance with procedures and tracking mechanisms for inventory control, acquisitions, supplies, and property management
- Coordinates other initiatives, such as inspection interrogatories

Facility Services Unit

The Facility Services Unit is responsible for the health and safety of Laboratory personnel and oversight of the Laboratory facility.

The following highlights the Unit's support and services:

- Manages the health service facility, which is staffed by a full-time registered nurse who organizes employee health and fitness programs
- Ensures compliance with the U.S. Environmental Protection Agency, U.S. Department of Transportation, Occupational Safety and Health Administration, and other federal, state, and local safety regulations and standards
- Coordinates hazardous-waste disposal. Reviews and/or establishes procedures for storing and inventorying chemicals and reagents
- Ensures compliance with perimeter-security policies and procedures, and installs and calibrates perimeter-security devices
- Maintains and modifies the Laboratory facility, including the grounds and fitness center, and coordinates facility usage during special events
- Oversees the food-service operations

Investigative and Prosecutive Graphics Unit

The Investigative and Prosecutive Graphics Unit, working in the Laboratory and the field, conducts crime scene surveys and witness interviews in order to plan, design, coordinate, and produce investigative aids and demonstrative evidence in support of FBI and national investigations. This support is provided in four program areas:

- **Crime Scene Survey, Documentation, and Reconstruction**—Conducts crime scene surveys and prepares documentation to produce two- and three-dimensional victim and crime scene reconstructions and computer-animated modeling depicting bullet trajectory analysis, line-of-sight analysis, and vehicular and human movement analysis.
- **Forensic Facial Imaging**—Conducts witness and/or victim interviews to prepare composite drawings, two- and three-dimensional facial reconstructions from skeletal remains, facial age progressions, postmortem reconstructions, digital photographic manipulations and retouches, and wanted flyers.
- **Demonstrative Evidence**—Provides enlarged documents, charts, maps, diagrams, photographic collages, floor plans, link-analyses, flow-and-check kite charts, time lines, technical renderings, and interactive and/or animated electronic demonstrative evidence used for court presentations.
- **Director's Office Support**—Provides support to the FBI Director's Office for the President and his staff, the Attorney General, Congress, the Department of Defense, other national and foreign officials, and the news media. Unit personnel also provide direct support to the FBI's Strategic Information and Operations Center, the Counterterrorism Division, and other operational FBI Headquarters Divisions.

Planning and Budget Unit

The Planning and Budget Unit oversees the Laboratory's financial requirements. Unit personnel monitor and track congressionally appropriated funds and coordinate and facilitate expending the funds according to government regulations.

The following highlights the Unit's support and services:

- Plans, compiles, analyzes, and formulates the Laboratory's financial requirements
- Acquires funds for the Laboratory and ensures adherence to contract regulations
- Monitors financial accounts to coordinate and facilitate expending funds
- Helps implement project-management standards and procedures by preparing and reviewing project-control documentation, automated tools and techniques, progress reporting, and training

2003 Accomplishments

- Managed expenditures totaling more than $140,000,000
- Processed 3,538 financial transactions
- Developed and implemented an online project and account management system
- Coordinated the development of the Laboratory's program plan
- Supported the relocation of personnel and equipment to the new Laboratory building from FBI Headquarters
- Facilitated furnishing the new Laboratory
- Coordinated special events, including the Laboratory dedication ceremony and a visit from the President

Structural Design Unit

The Structural Design Unit is responsible for planning, designing, and developing demonstrative evidence to support expert testimony during a trial. Three-dimensional scale models, exhibits, and displays are created to reconstruct crime scenes and clarify for the jury the location and spatial relationships of victims, perpetrators, witnesses, evidence, buildings, and vehicles.

Buildings and terrain where crimes have been committed are reconstructed from on-site measurements, aerial and on-site photographs, maps, witness interviews, computer-aided design files, and blueprints. Bomb devices are replicated from remnants found at the crime scene. Mannequins are created to illustrate the location of wounds. Scale models of vehicles involved in crimes are constructed.

Scale-surveillance models are also created to aid law enforcement personnel in extricating hostages during crisis-response scenarios. These three-dimensional models provide realistic and accurate depictions of building layouts, including elevations, entryways, stairs, and obstructions.

Convenience-Store Murders

Shortly after midnight on July 6, 1997, three people, including a 14-year-old girl, were brutally murdered and left in a walk-in cooler at a Lake Charles, Louisiana, convenience store. All had been shot multiple times in the head with a single 9 mm pistol. The telephone lines had been severed, the video surveillance tape was removed, and more than $10,000 was missing from the safe.

No suspects were produced in the initial investigation, and after four weeks the FBI was asked to enter into a joint investigation with a multiagency violent crimes task force. One witness provided details that were aired on Fox TV's *America's Most Wanted* program. The televised information yielded tips that led investigators to Thomas Frank Cisco, Jr.

Cisco failed his polygraph, refused further interviews, and provided an alibi for the night of the murders. However, his alibi was disproved, and he then confessed to the killings. Although he later recanted his confession, he was identified in a physical lineup by the witness who had provided investigators with the details that were aired on the television broadcast.

Structural Design Unit personnel created a scale model of KK's Corner convenience store, some areas of the parking lot, and models of the victims, suspects, and witness. The scale model was used during trial testimony on the direct- and cross-examination and helped the jury visualize the crime scene and the witness statements.

On October 17, 2000, Cisco was found guilty on all three counts of first-degree murder and sentenced to death.

Police Officers Killed

Two Beaufort County, South Carolina, sheriff's deputies responded to a domestic disturbance call at a mobile home on the evening of January 8, 2002. Five people lived there—two owners and a young couple with their six-month-old baby. The officers were told that a woman was being held against her will. The young woman, who feared for her life, handed her baby to the owners and stepped out of the home. Upon being given permission to search the premises, the deputies cautiously proceeded single file into the bathroom and bedroom. Abdiyyah ben Alkebulanyahh fired multiple rounds with a semiautomatic rifle through the bedroom closet. One deputy was killed instantly, but the other was able to fire his clip before he was killed. The assailant, slightly wounded in the gunfight, dropped his weapon and ran away. He was apprehended a short time later.

Because of the large number of projectiles and their trajectories, the crime scene was complex, making charts and photographs difficult to understand. The Beaufort County Sheriff's Department asked Structural Design Unit personnel to make a three-dimensional model to clarify the crime scene. Unit technicians gathered data at the crime scene and, in cooperation with South Carolina Law Enforcement Division Forensic Laboratory personnel, designed and created a model. A large portion of the mobile home and furniture was re-created. The different caliber weapons were placed in the model and identified by color. A Unit visual information specialist testified in court as to the accuracy of the reconstructed crime scene. The defendant, Alkebulanyahh, was found guilty and sentenced to death.

Rodney Joel Blach

During a three-day period in March 1998, six explosive devices were planted at four private residences and at the Alameda County water tower in Fremont, California. Four of the devices detonated, another exploded during a render-safe procedure, and the sixth was safely disarmed. One device was under the floorboards of a room inhabited by a 17-year-old girl, who barely survived, and two other bombings were in residences belonging to the current and former Fremont chiefs of police.

Investigators focused their inquiries on Rodney Joel Blach, a 54-year-old former Chicago police evidence technician. He had links to all the intended victims, and investigators discovered his alibi was suspect when a 3½ hour discrepancy was discovered. He was arrested in October 1999 and charged with 11 felony counts of premeditated attempted murder, arson, and possessing explosives.

For the trial, Structural Design Unit technicians were asked to re-create the crawl space under the current chief of police's house. This was accomplished after an intensive crime scene survey in which Unit personnel spent hours under the house, on their backs with flashlights, gathering hundreds of critical measurements. The model featured several removable pieces that revealed an intricate three-dimensional view of the subfloor area. The model was used throughout the four-month trial and during jury deliberations.

Blach was convicted on all 11 charges and was sentenced in September 2001 to 37 years to life in prison.

Laboratory Outreach Programs

Research Partnership Program

The Research Partnership Program, which is coordinated by the Laboratory's Counterterrorism and Forensic Science Research Unit, is an effort of FBI, state, and local scientific personnel to improve forensic science. Research and development projects and database building are funded through the Program. These projects leverage the experience of state and local forensic examiners for research purposes in disciplines that typically require extensive examiner training and experience to interpret results.

The primary goals of the Program are as follows:

- Enhance the transfer of new forensic technologies and procedures to caseworking examiners in state and local forensic laboratories by collaborative research and development, testing, and validation studies
- Facilitate the implementation of protocols defined by scientific working groups
- Catalyze the development of national forensic databases

In 2003 three internal research projects were implemented in the Program.

- **Permanence of Friction Ridge Skin Detail**—Permanence is one of the fundamental principles of the friction ridge discipline that permits identification. Although permanence is supported by the biological sciences, it has yet to be studied empirically by comparing fingerprints over time. This project will use the expertise of state and local laboratory latent print examiners to study the permanence of friction ridge skin detail.
- **Messenger RNA Profiling of Human Semen**—The goal of this project is to develop a set of messenger RNA assays that can be incorporated into an automated sperm-searching protocol. Four partner laboratories have been identified to participate. Initially, the partners will consult on developing plans for validating and establishing a state laboratory system. Representatives will return to the FBI to conduct validation work and then repeat the validation in their own laboratories.
- **Automotive Carpet Fiber Database**—Automotive carpet fibers are frequently found in abduction and homicide cases when victims were transported in vehicles. The FBI Laboratory's Trace Evidence Unit can determine the make, model, and year of vehicles on the basis of physical, optical, and chemical information searches in the Automotive Carpet Fiber Database. The contributions from state and local forensic laboratories will permit the database to be updated, maintained, and rendered effective as an investigative tool.

A Research Partner Program update was held on September 22, 2003, in conjunction with the annual Crime Laboratory Development Symposium in Minneapolis, Minnesota. The update featured 19 technical presentations by Laboratory research personnel and external contractors covering the biological, chemical, and physical sciences. Included were the following presentations:

- Automation of Forensic DNA Analysis
- Explosive Devices and Field Analysis
- Forensic Chemistry
- Human Identification
- Validation of the Basis for Patterned Evidence Identification

Visiting Scientist Program

The Visiting Scientist Program provides a connection between the FBI Laboratory and academia. The Program offers university students, postgraduates, and faculty the opportunity to enhance their education by participating in forensic research initiatives at the Counterterrorism and Forensic Science Research Unit using state-of-the-art equipment.

The program furthers the Unit's mission by providing additional scientific expertise to complement that of the staff scientists. Experienced staff scientists guide the visiting scientists' research by serving as mentors. Each visiting scientist is assigned one or two priority projects. The visiting scientists spend three months to three years working in the laboratories in Quantico, Virginia. At the end of their tenure, they are required to submit detailed reports and/or technical papers for publication in peer-reviewed scientific journals. In 2003 program funding allowed the FBI to offer this opportunity to 30 visiting scientists.

The Counterterrorism and Forensic Science Research Unit established an interagency agreement with the U.S. Department of Energy to participate in the science education programs administered by the Oak Ridge Institute for Science and Education. Interested people may apply to participate in the Visiting Scientist Program at the following website: www.orau.gov/orise.htm.

Specialized Forensic Science Training Program

The Specialized Forensic Science Training Program offers one- to four-week courses in a wide range of disciplines. In 2003, 85 courses were provided for federal, state, local, and international forensic laboratory examiners, investigators, and other law enforcement professionals.

The Program provides general training in the fundamentals of forensic chemistry and biology and provides training in the use of specific scientific techniques for identifying, collecting, preserving, and evaluating physical evidence. The courses provide hands-on training to enhance basic

skills and procedures and to introduce attendees to new or more advanced techniques.

In addition, periodic symposia stimulate discussion of techniques and issues relevant to each discipline.

The following are examples of courses taught by Laboratory examiners and research scientists in 2003:

- Crime Scene Investigation
- Crime Scene Photography
- Evidence Response Team Training
- Examination of Footwear Impression Evidence
- Forensic Analysis of Paints and Polymers
- Forensic Facial Imaging
- Forensic mtDNA Analysis
- Infrared Spectrometry of Trace Analysis
- Introduction to Hairs and Fibers
- Latent Fingerprint Photography
- Postblast Bombing Investigation
- Racketeering Records Analysis
- Techniques in Firearms Identification

Training Partnership Program

The Training Partnership Program is a collaboration with federal, state, and local training institutes to develop and provide standardized and validated forensic science courses that could be offered by any of the partners. Benefits of the Training Partnership Program include broad content review and approval and expanded geographic accessibility.

Some courses are provided in traditional classroom settings, and others are distance-based through the FBI Virtual Academy. The Virtual Academy was established to provide a single, comprehensive learning solution to the forensic science, law enforcement, and judicial communities. Law enforcement agencies may register at the following website so personnel can take advantage of the training offered through the FBI Virtual Academy: https://fbiva.fbiacademy.edu.

The following institutions are working with the Laboratory to become training partners, and additional collaborations are expected as this Program develops.

- California Criminalistics Institute, Sacramento, California
- Illinois State Police, Springfield, Illinois
- Midwest Forensics Resource Center, hosted at Iowa State University, Ames, Iowa
- National Center for Forensic Science, National Institute of Justice, hosted at the University of Central Florida, Orlando, Florida
- U.S. Drug Enforcement Administration, Washington, DC

Scientific Working Groups

Since the early 1990s, the Laboratory has sponsored Scientific Working Groups to improve forensic science discipline practices and build consensus with federal, state, and local forensic community partners.

In 2003, 21 Scientific Working Group meetings were held. The Groups' quality assurance, operations, validation, training, and examiner qualification guidelines were published in *Forensic Science Communications,* an online peer-reviewed journal published by FBI Laboratory personnel.

Currently, the Laboratory sponsors the following Groups:

- Scientific Working Group for Forensic Document Examination (SWGDOC)
- Scientific Working Group for Friction Ridge Analysis, Study and Technology (SWGFAST)
- Scientific Working Group for Materials Analysis (SWGMAT)
- Scientific Working Group for Microbial Genetics and Forensics (SWGMGF)*
- Scientific Working Group for Scent Detection Dogs (SWGDOG)*
- Scientific Working Group on Bloodstain Pattern Analysis (SWGSTAIN)
- Scientific Working Group on DNA Analysis Methods (SWGDAM)

- Scientific Working Group on Firearms and Toolmarks (SWGGUN)
- Scientific Working Group on Imaging Technologies (SWGIT)
- Scientific Working Group on the Forensic Analysis of Chemical Terrorism (SWGFACT)*

**New groups established in 2003 to address forensic analysis and handling of evidence related to biological, chemical, and radiological terrorism threats and cases*

Symposia for Crime Laboratory Development

Since 1973 the Laboratory has sponsored an annual Symposium for Crime Laboratory Development to provide management training for directors and senior managers of publicly funded forensic laboratories in the United States.

The 31st symposium was held September 23–25, 2003, at the University of Minnesota's Carlson School of Management. The theme of the symposium was *Achieving Excellence Through Partnership.* Commander Kirk Lippold, former Commander of the U.S. Navy's *USS Cole*, was the speaker for the opening plenary session. Instructors from the school's Executive Masters of Business Administration program provided graduate-level management training for more than 225 attendees from federal, state, and local forensic laboratories.

Forensic Science Communications

Forensic Science Communications is a peer-reviewed forensic science journal published quarterly on the Internet by FBI Laboratory personnel. The journal is a means of communication between forensic scientists, permitting information of value and interest to be rapidly disseminated among scientists and other interested persons.

Submissions to the journal may include letters to the editor; review, research, or feature manuscripts; book reviews; and technical notes or case reports.

Manuscripts and other information relating to the journal should be sent to

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Forensic Science Communications may be viewed online at
www.fbi.gov/hq/lab/fsc/current/index.htm

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FBI Laboratory 2003 Report

An FBI Laboratory Publication | Federal Bureau of Investigation | Quantico, Virginia