

The cover features a futuristic, high-tech theme. On the left, a green circuit board pattern is visible. In the center, a glowing blue grid floor extends into the distance, with a red laser beam forming a triangle on it. Above the grid, a transparent, curved tube and a stack of three circular discs are shown. To the right, there is a technical drawing of a robotic arm assembly. At the bottom, a hand is shown reaching up towards a row of computer keyboard keys. The background is a dark space with stars and nebulae.

FBI

July 1991

Law Enforcement Bulletin

**Identification:
A Move Toward the Future**



Features



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The Cover: The "technology explosion" witnessed in recent years will have a dramatic impact on law enforcement in the years to come.

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William S. Sessions, Director

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Identification

A Move Toward the Future

By
BRUCE J. BROTMAN
and
RHONDA K. PAVEL

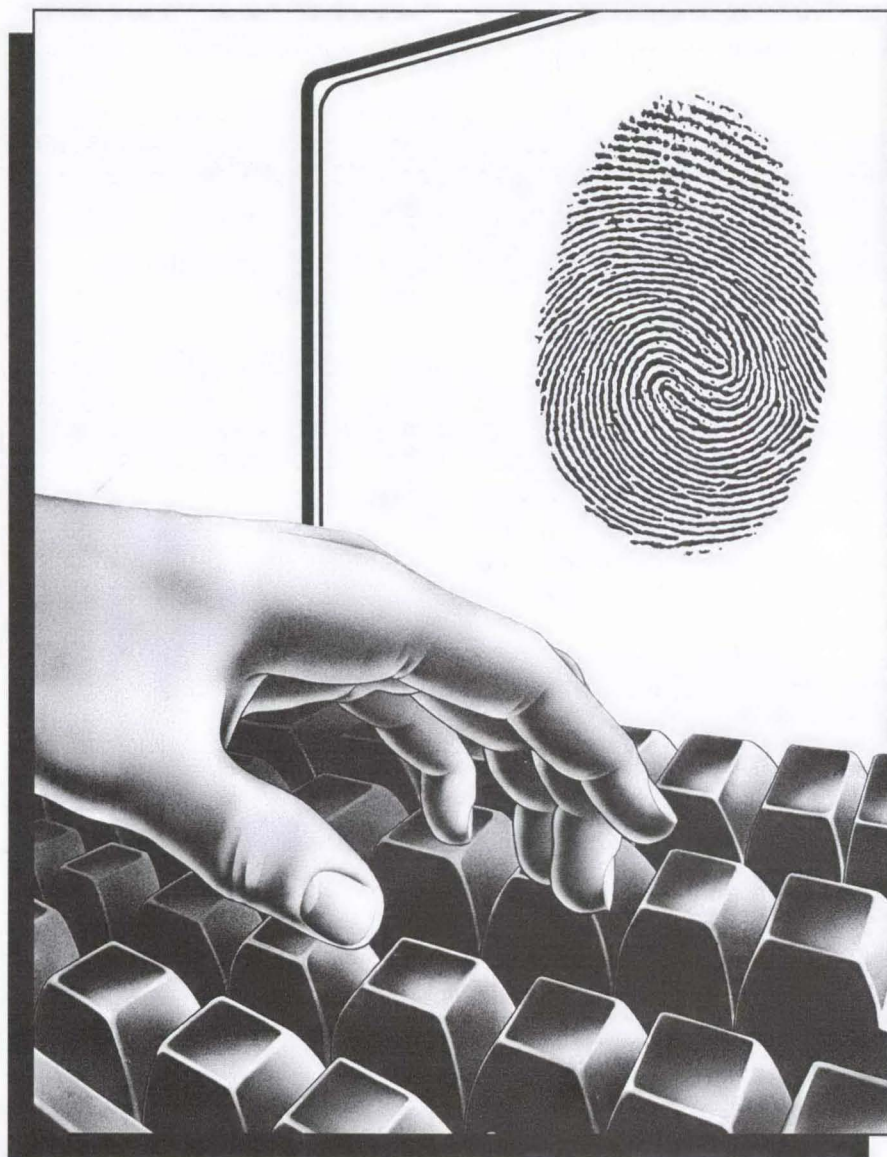
No one in law enforcement today could deny that the years ahead will bring many changes and challenges to the profession. Witness the transformation that has already taken place with regard to economics, demographics, politics, and technology. Each of these factors has already had major implications for law enforcement. And there is every reason to believe their impact will continue to have a profound effect.

Current trends and developments indicate that in the years to come, fingerprint identification will play a much wider role in law enforcement. This is why the FBI's Identification Division is pursuing a strategic plan to rebuild and improve essential services for its criminal justice users. By 1995, the FBI will have in operation a new system providing greatly expanded fingerprint identification services that will provide immeasurable benefits to law enforcement and other users nationwide.

AUTOMATED FINGERPRINT IDENTIFICATION—AN EVOLVING TECHNOLOGY

In the early 1960s, the FBI realized that the future of its Identification Division would be closely tied to its ability to incorporate automated technology into fingerprint processing operations. The subsequent research and development (R&D) initiatives of the Identification Division produced some of the first steps toward fingerprint automation.

During the ensuing years, commercial companies ventured into the field of fingerprint auto-



mation. Fingerprint identification technology flourished and grew more sophisticated. Several manufacturers developed automated fingerprint identification systems (AFIS) integrating automated 10-print and latent processing capabilities into one system. By the 1990s, these and other companies introduced the concept of "live-scan technology," a revolutionary new process requiring neither inked cards nor chemicals.

Many of the Identification Division's contributors capitalized on these emerging technologies to initiate their own automation projects and acquired their own AFISs. However, the simple expansion of

automated capabilities did not provide a cure-all for the problems that have traditionally plagued criminal identification efforts.

While these technological improvements afford law enforcement with newer, more advanced tools for performing their jobs, the ability to execute fast and efficient nationwide criminal searches remains deficient. Primarily, there are no guiding standards to ensure compatibility among dissimilar AFISs manufactured by competing commercial vendors. And although many States have automated systems, their inability to communicate with incompatible AFISs severely limits their effectiveness.

Factors Precipitating Improvements

The Identification Division realized the need for a more-cohesive system to link local, State, and Federal law enforcement agencies. Subsequently, division personnel began to examine their own operations to identify those areas that needed to be upgraded.

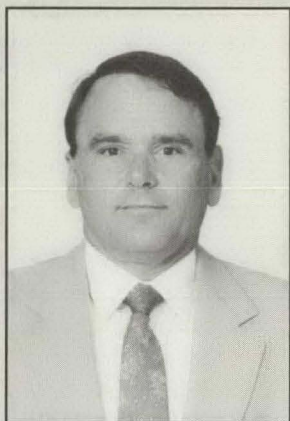
When first implemented, the technological developments pioneered by the Identification Division were state-of-the-art. However, in the intervening years, the industry made great strides toward producing equipment that was even more responsive to the specialized needs of the law enforcement community. But, unfortunately, the division was not able to obtain these latest technological innovations. Therefore, the acquisition of new hardware with improved capabilities emerged as a major factor in the division's strategic planning.

In addition, enacted legislation also influenced the division's long-range planning efforts. Pursuant to the Anti-Drug Abuse Act of 1988, the Attorney General mandated the FBI to ensure that the data in its automated systems were complete, accurate, and immediately available in order to identify felons who attempt to purchase firearms. Also, the Airports Security Act and recently enacted banking laws required screening of applicants for criminal histories. Implementation of these capabilities impacted considerably on the FBI's already overburdened automated system.

Methodology for Achieving Improvements

In June 1989, the FBI took steps to improve its essential identification services to its users by enlisting the assistance of the NCIC Advisory Policy Board (APB) to review the Identification Division's strategies and plans for automation and to make recommendations. Together, the Identification Division and the Identification Services Subcommittee of the NCIC APB produced a conceptual road map for "revitalization" of the division.

Essentially, the plan reflects a partnership between Federal, State, and local law enforcement to ensure that the Identification Division will be in a position to meet the increasing needs of its users into the 21st century. It focuses on the development and implementation of a complete Integrated Automated Fingerprint Identification System (IAFIS). The basis of this new national concept is an on-line image transmis-



Special Agent Brotman

Special Agent Brotman is the Section Chief of the Automation, Research and Development Section, Identification Division. Ms. Pavel (who requested no photo) is a Computer Systems Analyst assigned to the Automation, Research and Development Section, Identification Division.

sion network that interfaces law enforcement agencies nationwide.

Besides updating processes and technology, the greatest benefit would be accrued by relocating the division. Primarily, it would not be possible to install new technology in the Identification Division's current facilities at FBI Headquarters, while simultaneously maintaining current operations. Therefore, the total plan for improvements has become one of revitalization and relocation.

To this end, the FBI conducted a relocation study, which led to the selection of a site in Clarksburg, West Virginia, as the location for a new facility to house IAFIS equipment and operations. The design for the planned, multilevel building allows for the entire division to be housed within one location. More importantly, however, it will provide for the required expandability and flexibility to accommodate the new IAFIS.

IAFIS: THE INTEGRATION OF NEW TECHNOLOGIES AND CAPABILITIES

The envisioned future system of the Identification Division is the IAFIS, which will be developed using as its main premise the electronic or "paperless" submission of fingerprint cards and related documents. Basically, the system allows a suspect to be fingerprinted at the booking station using live-scan technology, thereby eliminating fingerprint cards and documents at every step of the process. Then, the fingerprint images and personal data will be processed by a local AFIS and electronically transmitted to a State

identification bureau for processing. If no identification is made, the data will be forwarded to the FBI's Identification Division. There, it will be processed by a highly advanced

essing. The fingerprint images and related data may either be processed by a local AFIS, transmitted directly to the State identification bureau, or if no identification is made at the

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...the FBI's Identification Division is pursuing a strategic plan to rebuild and improve essential services for its criminal justice users.

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AFIS, allowing for an electronic response to the booking station within hours.

The IAFIS will be developed using integrated architecture, modular design, and integrated implementation. Primarily, implementation of IAFIS will involve the integration of three new automation efforts:

- An Image Transmission Network (ITN) for paperless fingerprint submission and processing,
- Acquisition of a new advanced AFIS, and
- An upgraded Interstate Identification Index (III).

The Image Transmission Network

The Image Transmission Network (ITN) will eliminate the submission of hard-copy fingerprint cards and other documents. To accomplish this, live-scan fingerprinting technology will be used at the local level to create and to transmit electronic fingerprint images for proc-

State level, transmitted electronically and processed through the FBI's AFIS.

Ultimately, the ITN system will process the equivalent of over 70,000 fingerprint card submissions per day and electronically return a response to a criminal inquiry within 2 hours of the division's receipt of the request. The ITN should be fully operational by June 1995. Full operation will be achieved through a three-phased integration of ITN functions.

Integrating the functions

The first phase involves designing and building a prototype system at FBI Headquarters to demonstrate and test a paperless environment for processing live-scan and hard-copy submissions and various document receipts. States participating in this effort will be identified by the Identification Services Subcommittee of the NCIC Advisory Policy Board. Using a prototype approach allows the FBI to develop the ITN while maintaining the flexibility necessary for

successful integration into the IAFIS. The prototype's final design will lead to detailed specifications for the ITN.

These specifications will form the basis for the second phase, in which pilot States will be selected to

transmitted to remote users over the NCIC telecommunications network.

*Eliminating paper
with hardware*

It is anticipated that not all contributors will be submitting data

processing. Their use will provide a more-efficient identification and criminal recordkeeping service to the law enforcement community.

*Providing communication
among AFISs*

In addition to the new hardware, the Image Transmission Network will use a standard to provide a common interface for all AFISs. This standard is being developed as an American National Standards Institute standard in conjunction with the National Institute of Standards and Technology, AFIS and live-scan users, and equipment vendors.

Several benefits will be realized from the use of this standard. First, an acceptable standard fulfilling all the information requirements of the current system will support the direct, on-line submission of fingerprint image and identification data. It will also specify image compression algorithms for storage and transmission that will reduce costs for all agencies. Finally, it will establish a universal means of communication among all AFISs, allowing for enormous gains in productivity.

An Advanced AFIS

The minutiae-based AFIS will include a 10-print system for searching incoming fingerprint requests, as well as a latent fingerprint subsystem. Its objectives are to accelerate the processing of 10-print search requests and to improve identification of latent fingerprints through the use of advanced technology.

The Identification Division's current method of searching fingerprint characteristics requires full

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...the plan reflects a partnership between Federal, State, and local law enforcement...to meet the increasing needs of its users into the 21st century.

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submit electronic 10-print transactions. The final phase involves expanding the pilot and installing it at the new facility in West Virginia.

*Storing and retrieving
automated fingerprint images*

A successful paperless environment depends heavily on an Image Storage and Retrieval (ISR) system to capture, store, and retrieve electronic fingerprint images. The Image Transmission Network will incorporate an ISR system to store both rolled and plain impressions in digital form in an image data base.

Replacing the Identification Division's current manual filing system with the ISR system offers several advantages. Essentially, problems inherent in a file the size and complexity of the Identification Division's—out-of-file conditions, large numbers of misfiled prints, and heavy consumption of time and labor for manual filing and refiling—will be eliminated. In addition, these fingerprint images can be

electronically by the beginning of ITN operations. Therefore, some hard-copy processing will still be required. To support this requirement, the paper cards and documents will be converted, upon receipt, to an electronic format identical to that of electronic submissions. This conversion process will use new technology, specifically fingerprint card and document scanners and an Intelligent Character Recognition (ICR) system to provide electronic imaging capabilities for ITN.

The ICR system will convert text into computer processable characters for direct entry into the data base, thereby reducing the amount of manual data entry. The resulting increase in productivity will decrease the turnaround time to contributors.

For the most part, these three subsystems (fingerprint card scanners, document scanners, and the ICR system) will constitute the hardware solution to the final step in eliminating paper from fingerprint

NCIC fingerprint classification (NCIC-FPC). This procedure, which necessitates extensive training, will be replaced by one that requires only pattern-level classification. In this regard, a set of hardware and software requirements to classify fingerprints at the pattern level (e.g., arch, tented arch, right loop, whorl, etc.) automatically will be researched. Since manual fingerprint classification is labor-intensive and time-consuming, its elimination will directly affect the Identification Division's responsiveness to its contributors.

New minutiae matchers will be required to efficiently satisfy the total projected processing requirements for fingerprint matching in the new AFIS. In addition, the AFIS will employ newer latent fingerprint processing technology and features not in the Identification Division's current system. Use of current technology will yield better quality data with which to work. This, in turn, will equate to higher accuracy rates. AFIS will also search new 10-print records against a file of previously unidentified latents, as well as searching latents against other latents.

The Interstate Identification Index

The current Interstate Identification Index (III) will be upgraded to expand its on-line services for its 62,000 users. These improvements include implementation of the National Fingerprint File (NFF) concept; access to more criminal history data; the capability to transmit, store, and retrieve on-line electronic images of mug shots; and

an upgrade of the technology base of III for supporting the overall workload.

The National Fingerprint File

The National Fingerprint File (NFF) concept to decentralize the Nation's criminal history records system is being incorporated into the current system and interfaced with III. Participating States submit to the FBI only their first arrest fingerprint card for each subject. The Identification Division then establishes pointers identifying those States in which a person has an arrest record. When III receives an on-line request for a criminal history that contains such a pointer, it notifies the appropriate State to transmit the record to the requesting agency. As more States participate in this concept, it will reduce

the criminal fingerprint processing workload of the Identification Division while increasing the balance of responsibilities at the State level.

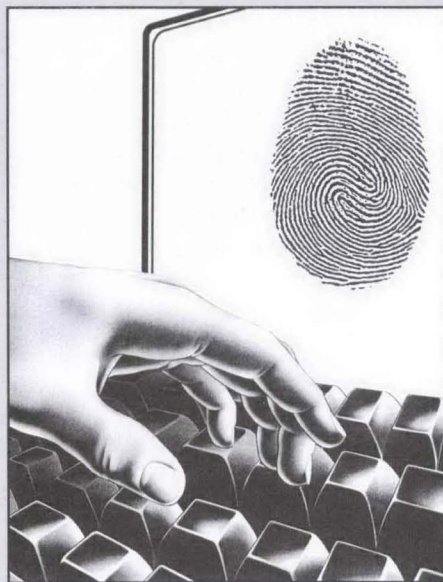
On-line criminal history records

Presently, the Identification Division has 8.8 million individual criminal history records that are not available for immediate identification of felons because only their personal descriptor data are automated. The arrest data for those who are currently active will also be automated. III users now have direct access to arrest histories of 14 million individuals. This effort will greatly increase that number.

Access to mug shots

The FBI is also exploring the integration of an Interstate Photo

"...the total plan for improvements has become one of revitalization and relocation."



System (IPS) into III to provide users the capability to enter, maintain, and retrieve a subject's photograph. The intent is to allow an individual's mug shot to be sent to a police station or another designated location for visual confirmation of the person's identity by the officer on the scene.

Crosschecking between indices

Enhancements will be made to III to provide full interaction between the NCIC wanted persons index and the III name index. As a result, any inquiry into one index will initiate an automatic inquiry of the other. Such crosschecking will increase the number of III on-line inquiries from the current volume of 77,000 per day to 600,000 per day, over a sevenfold increase.

Expansion of hardware

New hardware employing upgraded technology will be acquired to expand or replace portions of the III system. This equipment upgrade will provide an adequate, but expandable, baseline of processing power to satisfy the projected requirements for users and for the integrated systems that are part of IAFIS. Users will have on-line access through the NCIC telecommunications system, and on-line operations will be maintained without interruption.

A COOPERATIVE SYSTEM

In addition to its coordination with State and local entities, the Identification Division is also working with other Federal agencies that have embarked on their own

automated efforts. For example, the division is fully supportive of the U.S. Immigration and Naturalization Service's (INS) initiative to establish live-scan stations at U.S. ports of entry to communicate on-line with a central AFIS. One INS goal is to identify individuals with prior illegal entry arrests before they

“**...IAFIS...will be developed using as its main premise the electronic or 'paperless' submission of fingerprint cards and related documents.**”

gain entry into the country. Design of IAFIS will include INS's specialized requirements.

The U.S. Secret Service and U.S. Postal Service also have specialized identification needs. The Identification Division is cooperating with these agencies to ensure that their ultimate systems are compatible with, and any particular requirements they have are incorporated into, IAFIS. This will eliminate duplication of effort and ultimately result in a savings to the Government.

The Identification Division has also undertaken a collaborative technical effort with the United Kingdom (U.K.) Home Office. The technical staffs of both organizations will pool their resources into a joint

effort to achieve the development of a faster, more improved AFIS. The cooperative U.S. and U.K. scientific and technological programs leading to development of AFIS will support both organizations' efforts to further worldwide fingerprint searching and identification. The fruits of this labor will support all of law enforcement, from local police agencies to national and international organizations.

CONCLUSION

The goal of the FBI's Identification Division is to rebuild and to improve essential identification services to its criminal justice users. This includes meeting not only the needs of the users but also the challenge of technological advances that have created incompatible State automated fingerprint identification systems.

IAFIS will return enormous dividends to a society plagued by violent crimes committed by repeat offenders. It will become a valuable tool to law enforcement officers attempting to identify sophisticated criminals who prey upon society. The safety of the public will be served by the expeditious removal of these felons from the streets.

To achieve this, the Identification Division is cooperating with Federal, State, and local agencies to weave their requirements into the design of IAFIS. Doing so will ensure that the FBI is in a position to meet the law enforcement community's growing needs. In essence, IAFIS will provide the impetus required to propel the Identification Division and all of law enforcement into the 21st century.

LEB

POLICE EXECUTIVE LEADERSHIP

DONALD G. HANNA

Police Executive Leadership by Donald G. Hanna, Stipes Publishing Company, Champaign, Illinois, 1990.

Police Executive Leadership is an excellent book for a newly appointed chief, one contemplating a change of departments, or a chief who wishes to make substantial organizational changes. The author has the benefit of 22 years' experience as a police chief and is well-qualified to address the concerns facing today's law enforcement managers. This book discusses a wide range of issues that police administrators must face, including budget restrictions, rising crime rates, employee dissatisfaction, community support, unionization, and relations with city government.

The first three chapters set the stage with discussions of leadership basics, management techniques, and sources of power. In addition, the author provides guidelines for chiefs to use in setting long-range (5 to 10 years) plans for their departments. Chapters four and five discuss leadership responsibilities

and executive obligations necessary to be a successful chief.

Chapters six to eight outline the development of a corporate strategy for a police department and discuss how to enlist the support of employees, city officials, and the community that is essential for implementing a successful program. The final three chapters further explore the relationship between the chief, mayor, and city manager. They also address conflict resolution techniques and offer suggestions for dealing with criticism and discouragement.

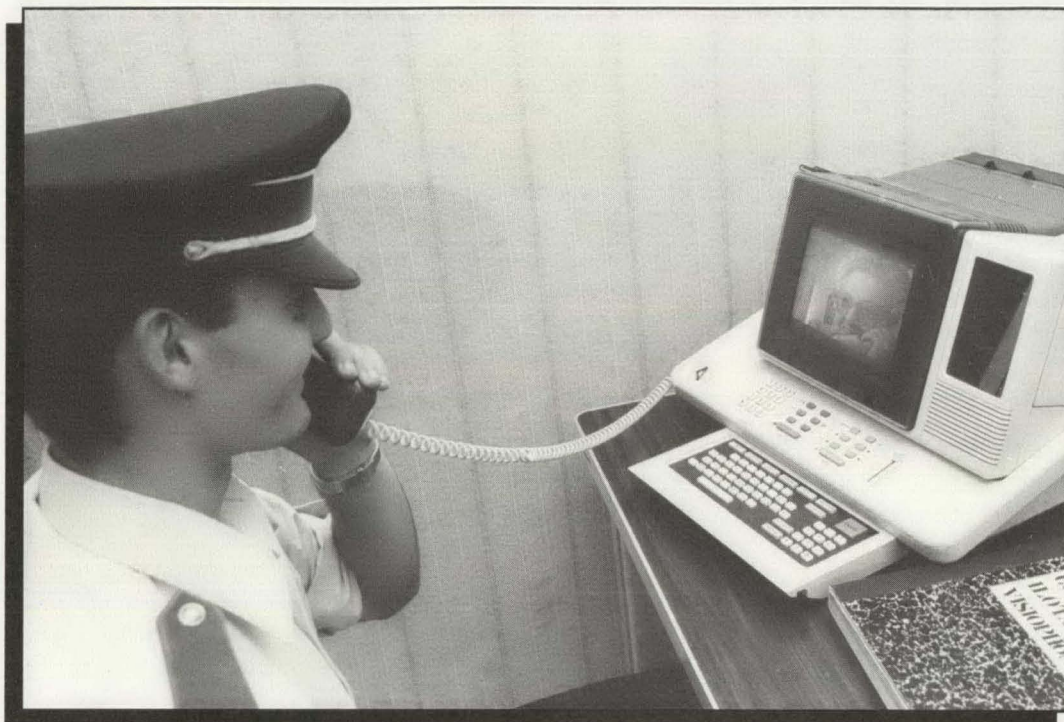
The discussion of staff development and staff support is particularly relevant to today's police agencies. The background of new employees is quite different, and in some instances, much better than it was 30 years ago. The author discusses some of the changes and outlines some methods of enlisting department support for resolving any potential problems these changes could cause.

The strength of *Police Executive Leadership* is that it is written by a practitioner. The author brings valuable experience and expertise to the discussion; he is realistic in his approach and recognizes that a police chief cannot, and will not, please everyone in the community with every decision. His formula for final evaluation of a decision is to review it for adherence to a set of principles and values. If it is the right thing to do, proceed and do the best job possible.

Reviewed by
Chief Larry Joiner (retired)
Kansas City Police Department
Kansas City, Missouri

Visiophones

French High-Tech Security



By
PIERRE MARIE
BOURNIQUEL

High-tech security techniques, which may become commonplace in the next century, are being tested in the French resort city of Biarritz. The visiophone, a device that transmits both audio and visual images across fiber optic lines, is being used by the Biarritz Police Department to augment traditional policing techniques. The device provides personnel in the police station the opportunity to access visually the interiors of offices, stores, nursing homes, and some residences in the city. While this pilot program began small, it has

grown to include over 1,500 units and has changed policing methods and public perception about police effectiveness.

BIARRITZ AND THE VISIOPHONE

Biarritz, once a renowned resort destination for American and European vacationers, had fallen on hard economic times after its popularity was eclipsed by other resort areas on the Atlantic and Mediterranean coasts. However, when French Telecom, the French telephone company, began to search for a suit-

able site for its visiophone pilot program, Biarritz met the requirements and was chosen due to several important factors:

- The experiment was to take place in a medium-sized city; the population of Biarritz, though it swells to 100,000 in the summer, remains at about 30,000 during the remainder of the year.
- The city's old telephone network needed refurbishing.
- The city's geographical location and population,

largely made up of retirees, was well-suited for the visiophone experiment.

The visiophone itself is a compact device, measuring 47cm (18") wide, 42cm (16") deep, and 30cm (11") high. It includes a 17cm (3") square screen, a detachable camera on the right side, a telephonic module, a full keyboard (with numbers and letters), and a voice amplifier. The instrument, which has the ability to access Minitel (the Telecom computer), produces either black-and-white or color images, depending on the type of camera used.

For this program, installation of the visiophone is free, with monthly costs averaging \$14.50. Visiophonic calls are billed at the same rate as regular telephone communications.

The initial network of 50 subscribers in 1985 has steadily grown. While security was not the motivation for the development of this pilot program, it quickly became obvious to the local police that the system offered potentially valuable applications in the realm of enhanced security, especially for the large population of elderly citizens in Biarritz.

POLICE USE OF THE VISIOPHONE

Telesurveillance

A number of banks and businesses throughout the city have alarm systems that are connected to police headquarters. These alarms are activated accidentally several times a day, resulting in wasted time and effort by the police. But now, when an alarm sounds, it is possible to

conduct an initial investigation of the establishment using the visiophone.

In a usual case, the watch officer contacts the business by visiophone once an alarm sounds, and requests that a visual scan of the interior be conducted using the detachable camera. All doubt can be resolved without an officer leaving the precinct. However, if doubt remains—no answer to the visiophone, poor vision through the camera, or suspicious activity observed in the premises—a patrol is dispatched immediately. The patrol then knows that this may not be a routine call and will naturally exercise more caution.

Visiophonic Patrolling

As mentioned earlier, the population of Biarritz includes a significant number of elderly persons. The majority of these retirees have worked elsewhere and now find themselves isolated from their families. Many

have developed a sense of insecurity fueled by accounts of rising crime rates.

It is the responsibility of the police, to some degree, to ease their feelings of insecurity. To this end, a plan was developed, in late 1988, to integrate the visiophone with the traditional patrol function.

This plan involves 500 subscribers and impacts approximately 1,000 residents of the community. The initial effort required beat officers to contact residents over the age of 65 personally and provide them with a written explanation describing the program. These residents were then informed that if they desired, the police would contact them about twice a month by visiophone.

Visiophonic patrolling is not intended to replace the traditional patrol function. Instead, it is meant to supplement it. The visiophone allows the police, in a sense, to enter the door of the elderly and reassure them concerning their security.

“...advances in technology, such as the visiophone, are providing...unprecedented opportunities in the realm of security and surveillance....”



Mr. Bourniquel is the Commissaire Principal—Chief of Police—Biarritz, France.

"Visiophonic patrolling is not intended to replace the traditional patrol function. Instead, it is meant to supplement it."



Because many of the elderly reside in high-rise apartment buildings, the opportunity for door-to-door personal contact by the police is significantly reduced. The visiophone provides a more-intimate level of contact than ever before possible in these situations.

Answering the Call

The visiophone is, of course, a two-way system, allowing a citizen with the device to call the police and be greeted by the reassuring image of an officer on the screen. When an emergency call is placed, the watch officer can view the interior of the premises and maintain audiovisual contact with the caller while the patrol is making its way to the scene. This has proven particularly reassuring, especially to elderly residents who become very anxious when facing a potentially

dangerous situation feeling isolated and alone.

RESULTS

Early reaction to the police use of the visiophone has been very positive. Residents and businesses have expressed appreciation and a new level of regard for the police since visiophonic patrolling and telesurveillance have been instituted. Factors contributing to the success of the visiophone program were studied by the National Center of Telecommunication Studies (France). The NCTS drew these conclusions:

- 90% of the elderly persons surveyed are very satisfied with the type of police contact made available by the visiophone.
- The visiophone provides a much more efficient means

of communication than the telephone, since during a typical conversation, as much as 40% of the message is communicated by gestures and countenance. The visiophone permits the communication of the visual signals that the telephone misses.

- Because communication via the visiophone is interactive, rather than passive, more information is retained by the citizen during a conversation.

In addition, the visiophone is rapidly becoming a valuable investigative tool, allowing a large number of contacts in a relatively short time. Officers can attain visual contact of a victim, witness, or potential suspect before ever leaving the precinct.

CONCLUSION

The technology of the 21st century is augmenting, not replacing, traditional police functions in Biarritz, France. Personal contact with victims and witnesses is still an important responsibility of the police department, as is sound investigative work and code enforcement. However, advances in technology, such as the visiophone, are providing law enforcement with unprecedented opportunities in the realm of security and surveillance that can be realized today. In this pilot program, both the police and the residents of the community are discovering that modern technology can be used effectively and responsibly to enhance security and to expand the protection and services offered by law enforcement.

LEB

The FBI's Forensic DNA Analysis Program

By
JAY V. MILLER



DNA testing is one of the most significant breakthroughs in forensic science. Applying DNA technology to the identification of individual biological specimens gives crime laboratories and law enforcement a new tool for resolving violent crimes and sex offenses.

The FBI's DNA program covers four basic areas—DNA casework, technical assistance, the National DNA Index, and DNA research. This article updates the FBI's progress in these areas and highlights the need for uniform testing methods as DNA technology becomes more widespread.

DNA CASEWORK

The FBI Laboratory, which began conducting forensic casework in 1988, is now the principal provider of forensic DNA testing services in the Nation. The Lab receives DNA cases from law enforcement agencies throughout the country, conducting more forensic DNA examinations than all other public and private forensic laboratories combined.

The demand for forensic DNA typing continues to grow as the technique gains judicial acceptance. Since 1988, DNA examiners from the FBI Laboratory have testified in over 120 trials and admissibility

hearings throughout the United States.¹ Of the approximately 2,000 DNA cases submitted annually to the FBI Laboratory's DNA Unit, about two-thirds are for rape investigations and the remaining one-third involve murder or other violent crimes. Most cases submitted to the Laboratory for DNA typing (or profiling) cannot be conclusively resolved using traditional forensic tests for blood or semen. However, the results of DNA typing can be used to associate biological evidence found at crime scenes with specific individuals, or to exclude suspects.

About 75 percent of the DNA cases examined by the FBI Labora-

tory yield sufficient interpretable information to determine conclusively whether the evidence can be associated with the subject in question or whether the subject can be excluded from consideration. Significantly, about one-third of the examinations performed by the FBI's DNA Unit have excluded the suspect identified by the submitting law enforcement

agency as the source of the biological evidence collected from the crime scene.

TRAINING, STANDARDS, AND TECHNICAL ASSISTANCE

The FBI Laboratory conducts DNA training and research at the Forensic Science Research and Training Center (FSRTC) located at the FBI Academy in Quantico, Virginia. The FSRTC is the focus of the FBI's efforts to provide a full range of technical assistance to State and local crime labs working to implement DNA testing.

The FSRTC provides classroom and laboratory training in DNA analysis methods, works to develop national standards and guidelines for DNA testing, conducts technical seminars, and sponsors the Visiting Scientist Program. The FBI Laboratory has been working aggressively to educate State and local crime lab personnel on DNA analysis techniques and to promote a standardized approach for DNA testing.

Training

Since 1989, the FSRTC has conducted 10, 4-week DNA courses to train over 270 forensic scientists from State and local laboratories. In addition, the FSRTC has trained 29 forensic technicians from 12 foreign countries.

Following each DNA course, a few graduates remain for an additional 3 months as "visiting scientists" at the FSRTC. Visiting scientists work with the FBI's researchers to refine existing DNA analysis methods and to assist in the research and validation of new techniques. A

total of 29 forensic scientists from 26 law enforcement agencies have participated in this program.

In addition, a 1-week course on how to present expert testimony in court for DNA cases is currently being developed for State and local DNA examiners. And, the FSRTC frequently hosts conferences on technical and legal issues concerning DNA.

Standards

As a Federal agency, the FBI is in a unique position to provide leadership in developing national standards for forensic DNA testing. Still, the cooperation and assistance of law enforcement officials at State and local levels is necessary to create a national system.

Toward that end, the FBI Laboratory sponsors the Technical Working Group on DNA Analysis Methods (TWGDAM), which provides a forum for crime laboratories to discuss and exchange technical information on DNA testing. The TWGDAM committee was established as a cooperative effort to formulate standards and guidelines for forensic DNA laboratories.

TWGDAM is comprised of scientists from industry, forensic laboratories, and the academic community, who meet several times each year. In its effort to build consensus and to define guidelines for DNA laboratories, quality assurance guidelines for forensic DNA testing and guidelines for DNA proficiency testing were subsequently published by TWGDAM. Adherence to these guidelines is often considered by courts to be a major factor in determining the admissibility of DNA

“DNA profiling may be the most significant breakthrough in forensic science since the development of fingerprinting.”



Mr. Miller is program manager for the National DNA Index at FBI Headquarters, Washington, DC.

test results as forensic evidence. And, in April 1991, TWGDAM revised and expanded these guidelines, in anticipation of the next generation of DNA technology.

Currently, 13 State and local crime labs are performing forensic DNA analysis according to FBI protocol. Most of these laboratories are members of the TWGDAM committee. An additional 8 to 10 laboratories will begin performing DNA casework based on the FBI protocol by the end of 1991.

Technical Assistance

A survey conducted by the FBI Laboratory in 1990 measured the plans and attitudes of State and local crime laboratory directors regarding DNA testing. The survey found overwhelming support for the FBI's efforts in conducting research on DNA analysis methods, training State and local DNA examiners, and maintaining centralized files for a national DNA data base. In addition, the survey revealed support for the FBI Laboratory's efforts to develop and provide DNA-related software and automation tools to help State and local crime laboratories establish their own DNA testing capabilities.

The FBI Laboratory works closely with the law enforcement community to advise on policy issues affecting forensic DNA testing. The National Association of Attorneys General, the National District Attorneys Association, and the American Society of Crime Laboratory Directors (ASCLD) have issued resolutions supporting the concept and the need for national DNA testing standards. In addition,

ASCLD's Laboratory Accreditation Board adopted a resolution calling for the establishment of a Proficiency Testing Program for accredited laboratories.

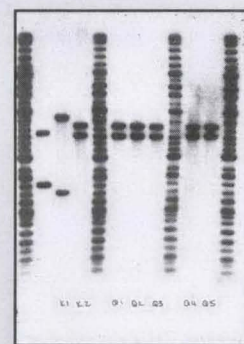
The FBI also advises State legislatures considering legislation

regarding DNA testing programs, admissibility of DNA evidence, and the establishment of State DNA data bases. And, the Laboratory frequently provides speakers to address conferences and seminars on forensic DNA testing.



DNA Profiles

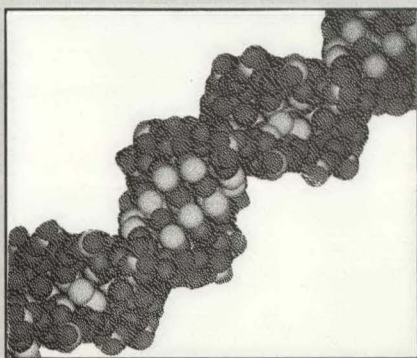
This picture is from a rape case. The forensic evidence is from vaginal swabs taken from the victim at the hospital where she was treated. Investigators wanted to know if the DNA from the sperm cells on the swabs matched the suspect's DNA. Known blood samples were then taken from the victim (K1) and suspect (K2). The lanes marked Q1 and Q2 (female) show the DNA banding pattern from the female portion of the vaginal swabbing. They match the victim's bands in K1. The lanes marked Q1 and Q2 (male) contain the male sample from the same swabs; they match the suspect's bands in K2, thus linking the suspect to the victim.



This picture shows the banding pattern for a DNA probing of evidence recovered in a murder investigation. Blood stains were found on the suspect's clothing, and investigators wanted to determine whether it came from the victim or the suspect. Blood samples were collected from both the victim and suspect for comparison to the blood found on the suspect's clothing. The lane marked K1 shows the suspect's bands from his known sample. The K2 lane shows the victim's bands from his known sample. These bands were then compared to the questioned samples (Q1-Q5) taken from the suspect's clothing. The pattern in K2 matches the patterns in the lanes Q1-Q5, thereby associating the suspect with the victim and the crime scene.

NATIONAL DNA INDEX

The FBI is establishing a National DNA Index to enable crime laboratories to exchange DNA profiles for unknown subjects and convicted sex offenders. The index will assist agencies in developing investigative leads, since subjects can be searched against the file of convicted offenders. The index will also serve as a clearinghouse for DNA pro-



What is DNA Analysis?

Genetic patterns found in blood or semen can be as distinctive as fingerprints. Traditional serology tests on body fluids often do not discriminate enough to either exclude or include a suspect from a crime. DNA analysis provides much more conclusive results.

The unique genetic patterns found in each person's DNA make it possible to associate a suspect with a crime, or to exclude a suspect, with a very high degree of accuracy. Except in the case of identical twins, every person's DNA, and resulting DNA pattern, is different.

files, directing the querying crime laboratory to the source laboratory when there is a "hit" in the index.

The FBI is developing computer software to automate the functions of forensic DNA laboratories and to link State and local laboratories to the national system.² The software will be provided free to crime laboratories participating in the National DNA Index.

The system is being designed to ensure privacy and security. Rather than store criminal history information, the index will store only DNA profiles. When a match is made, the two crime laboratories involved (the one conducting the query and the one that originally submitted the matching profile) can then exchange detailed technical information to verify the match and to coordinate information flow between the respective investigating agencies. However, in order to guarantee an effective system and to ensure that results are comparable, all crime laboratories must use substantially the same methods for DNA testing.

The FBI is working with 10 pilot DNA laboratories (in the 7 cooperating States) to gauge the feasibility and operational requirements of the National DNA Index system. Testing the basic means for exchanging DNA profiles among laboratories will soon be complete, and a full test of the National DNA Index in the pilot laboratories should occur in 1992.

The FBI will safeguard DNA profiles stored in the national system in three major ways.

- 1) The system will be designed and tested to protect against unauthorized access.

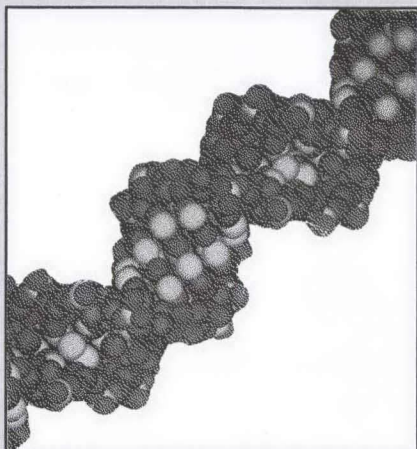
Only crime laboratories that are part of duly constituted law enforcement agencies will have authorized access to the national system.

- 2) Personal identifying information stored in the national data base will be minimized, thus affording greater protection against unauthorized access that could yield the DNA profile for a particular individual. Only the numerical form of the DNA profile will be stored in the national index.

- 3) The FBI Laboratory is working with the National Crime Information Center (NCIC) to incorporate proven security concepts and procedures from the NCIC system into the design and implementation of National DNA Index.

DNA RESEARCH

The FSRTC continually works to develop new forensic DNA technology. The Laboratory recently began research to develop the next generation of forensic DNA analysis methods. This new generation will be based on the polymerase chain reaction (PCR), a technique that multiplies the quantity of DNA material obtained from crime scenes to a level sufficient for forensic analysis. DNA tests based on PCR will allow analysis of much smaller specimens than is currently possible and will also provide crime laboratories with a more rapid way of identifying biological evidence from violent crimes.



How DNA is Tested

First, the DNA is extracted from the blood or semen sample taken from the forensic specimen. Only a small amount of material containing DNA is needed to perform the test. Other types of body tissue, such as skin, bone, muscle, and hair roots, also contain DNA, but blood and semen are the richest sources.

Then, enzymes, which are a type of protein, are used to cut the DNA into fragments. These fragments are separated, according to size, by a process called electrophoresis. The DNA fragments are placed in one end of a slab of gelatin, which is then charged with

electricity. The DNA fragments migrate through the gel, with the shorter fragments moving faster than the longer fragments. When the electricity is removed, the fragments are left sorted by length in the gelatin. DNA from the victim, suspect, and crime scene evidence are run through the gel in parallel lanes.

The DNA fragments are then transferred from the gel to a nylon membrane to fix their positions permanently. The membrane is "bathed" in a series of probes to locate DNA fragments containing known complementary sequences within the DNA molecule. Each probe contains a radioactive tag and matches a target area of the DNA molecule.

The target areas of the DNA molecule used by the FBI do not contain any genetic information of known purpose. The FBI Laboratory selected target areas that do not relate to any known inherited trait or characteristic, such as eye or hair color, or tendency for any known health condition. These target areas were selected because they vary widely within the human population and are ideally suited for identifying or associating biological samples.

To make the target DNA fragments visible, the membrane is placed against X-ray film and radiation from each probe registers the location of the fragment on the film. Because low-level radiation is used, this step takes approximately 1 week for each probe. Two bands are usually highlighted by each probe—corresponding to one band from each parent. Typically, a membrane is probed four times to confirm the association or exclusion between the evidence and the suspect's sample.

After the X-ray film is developed, the patterns of bands are compared and analyzed using computer software. If the patterns are the same, it is very likely that some of the cells containing DNA in the evidence sample came from the individual in question. Though a visual match can be seen, a computer is used to calculate the lengths of the DNA fragments, and the estimated fragment lengths are stored in a local data base. Only the numerical values of the fragments are stored in the DNA data base, not the image of the X-ray film or any other genetic information that may be contained in the DNA sample.

CONCLUSION

DNA profiling may be the most significant breakthrough in forensic science since the development of fingerprinting. The FBI is working closely with State and local crime laboratories to enhance DNA profiling techniques and to establish a National DNA Index. To ensure an

effective and secure system, the FBI Laboratory is fostering a uniform approach to DNA testing and profiling. This will eventually allow crime laboratories to exchange DNA profiles for known sex offenders and other violent criminals, providing a valuable new weapon for both investigators and prosecutors. **LEB**

Footnotes

¹ As with all types of forensic examinations provided by the FBI Laboratory, DNA analysis is free to any duly constituted law enforcement agency. In addition, the requesting agencies do not incur any travel expenses for DNA examiners who must testify in court.

² Arizona, California, Colorado, Florida, Illinois, Iowa, Michigan, Minnesota, Nevada, South Dakota, Virginia, and Washington have passed laws requiring the establishment of DNA data bases for convicted sex offenders or violent criminals.

Police Practices



Operation STAR

Miami, Florida, attracts a significant number of tourists each year. The climate of the city acts as a magnet to those wanting to escape to a place known for its balmy weather, sunshine, surf, and sand. In turn, these tourists have to offer what every U.S. city needs—money. Without these tourist dollars, Miami's economy suffers considerably. Therefore, the city must remain attractive to vacationers. One way to ensure this is to reduce the number of crimes committed against tourists.

To protect visitors from the city's criminal element, the Miami

Police Department instituted Operation STAR (Safeguarding Tourists Against Robberies). The department took this action when it began to notice an upswing in robberies involving tourists.

The Problem

Increasingly, vacationers and business travelers were becoming the prey of criminals. Those committing crimes would target people driving rental vehicles, knowing that the occupants always carried money, cameras, or other valuables. Also, since these victims were from out of town, they usually were reluctant to return to

be witnesses for the prosecution, and the criminals realized this.

Criminals developed innovative approaches to their victims. One method was to bump the rear of the victims' vehicle with their own. The victims, believing they were involved in a minor accident, would exit their vehicle to assess the damage. When they did this, the criminals, using force or at gunpoint, would rob the victims of money, jewelry, and sometimes even the rented car.

Another effective method was to pull alongside vehicles and gesture or yell to the passengers that something was wrong. When the occupants stopped to investigate, they would fall victim to the robbery. Or, the criminals would simply drive through areas of the city looking for people trying to read a map. They would then approach the vehicle, as if they were going to offer assistance. In most cases, however, they would just open the door, drag the victims from the vehicle, and commit the robbery.

The Solution

The department realized that it must take a proactive approach to this problem. One idea that surfaced was to conduct decoy operations within areas of the city that attracted large tourist populations. This decoy operation was given the name "Operation STAR."

To begin, two Operation STAR teams were formed. Each consisted of a sergeant and seven

officers, one of whom was female. It was decided to use a female decoy officer to increase the appearance of vulnerability.

The decoy would stop her rented vehicle in one of the targeted areas and raise the hood to make it appear as a disabled vehicle. Or, she would stop to use a pay phone and act as if she was calling to get directions. At all times, the other officers, riding in an undercover vehicle, kept the decoy under surveillance, including the use of a video camera. A video tape showing what transpired during the robberies was especially useful for prosecution.

Good Samaritans

Oftentimes, people from the area offered to assist the female decoy officer. On one occasion, a vehicle with three occupants drove past the decoy vehicle and noticed the lone female. They circled the block and parked their vehicle nearby. One suspect stayed in the car with the engine running, while the other two approached the decoy officer. As they began to walk toward the decoy, a tow truck operator stopped to help the would-be victim and refused to leave, even though the decoy did not want his help. Seeing this, the two suspects then walked back to the car and departed the area.

Use of the Media

The department decided to conduct a media blitz of Operation STAR to deter criminal activity. News personnel from a local tele-

vision station were invited to ride with the STAR teams and video tape what transpired. Because of

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the wide publicity, criminals became wary of tourists, not knowing if they were really visitors or the decoy team in action.

Additional Resources

The Operation STAR teams enlisted the help of the department's Career Criminal Detail to monitor suspects as they were processed through the criminal justice system. Some of the offenders had several previous

arrests, mostly for robbery. This fact resulted in many remaining in custody with increased bonds and facing longer sentences upon conviction.

Conclusion

Operation STAR continues to shine in Miami. During the initial operation, the city realized a 12-percent reduction in robberies. In fact, August and September 1990, the first 2 months of Operation STAR, showed the lowest number of robberies reported for any month during the entire fiscal year.

Because of the success of Operation STAR, the department formed a new detail that will work only decoy operations, although using different scenarios. Hopefully, tourists will realize that the police department is working to make their visits to Miami enjoyable by ensuring that they are crime-free.

LEB

Commander M. Frank Shonberger, Crime Scene Investigation Unit, and Sgt. Bradford Swink, Supervisor of the Robbery Detail, Miami, Florida, Police Department, provided the information for this column.

Police Practices serves as an information source for unique or noteworthy methods, techniques, or operations of law enforcement agencies. Submissions should be no more than 750 words (3 pages, double spaced and typed) and should be directed to Kathy Sulewski, Managing Editor, *FBI Law Enforcement Bulletin*, Room 7262, 10th & Pennsylvania Ave., NW, Washington, DC 20535.

European Law Enforcement After 1992

By JAN BLAAUW

Some 200 years ago, President George Washington made this observation: "Some day, taking its pattern from the United States, there will be founded a United States of Europe."

Whether the changes now taking place in Europe will eventually prove Washington's prediction to be accurate remains to be seen, but it is clear that the Western European community has embarked on a path toward a level of integration and cooperation unprecedented in its history. This movement toward integration will have profound effects upon almost every aspect of European life and will produce fundamental changes in many long-held institutions.

Although the forthcoming changes in commerce and trade have received much attention on both sides of the Atlantic—and the Pacific for that matter—there has been very little discussion outside Europe of the factors that will transform civil and social institutions, including law enforcement, in the "new Europe." The fact is: Significant changes for European law enforcement will result from the 1992 agreement and now is the time to begin to assess the potential problems and opportunities that lie ahead.

BACKGROUND

The Single European Act of 1987 introduces article 8a into the European Economic Community (EEC) Treaty of 1957:

"...that the Community shall adopt measures with an aim of progressively establishing the internal market over a period expiring on 31 December 1992...the internal market is an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured in accordance with the provisions of the Treaty."

In addition, in June 1990, the so-called Schengen countries—Germany, France, Holland, Belgium, and Luxembourg—agreed to a series of long-term measures intended to result in an internal border-free area within those nations. This agreement is considered a pilot program for the seven other European Community (EC) countries.

DISCUSSIONS WITHIN LAW ENFORCEMENT

The elimination of internal frontiers will, of course, have tremendous effects on policing after 1992 within and between the 12 EC countries. Not surpris-



Mr. Blaauw is the former Chief Commissioner of Police, Rotterdam, Holland.

ingly, widespread discussions on this subject are presently taking place among the various police forces of Western Europe. However, any discussion concerning law enforcement in Europe after 1992 will prove more fruitful if considered in the context of three important elements: Current social reality, the contemporary international crime situation and its relation to the European police, and realistic strategies for coping with the coming changes.

Current Social Reality

Since the end of World War II, Western Europe and the West in general have experienced an era characterized by enormous developments in various fields, such as communications and transportation. Never before had advances in science and technology been adopted so quickly to transform people's daily lives.

These rapid developments have had significant results, some of which were anticipated and some of which were not. The globe, in almost every sense, is

smaller than it was at the close of World War II. Increased trade, instant communication, mass tourism—we all know the many benefits of technology and the effects of this trend toward globalization.

Unfortunately, however, all the effects have not been so positive. Social unrest, manifested by those who consider themselves disenfranchised from the general affluence around them, has been particularly acute in Europe since the close of the Second World War. Crimes of a global nature, such as terrorism, drug trading, and illegal immigration, tend to increase yearly as criminals seek to manipulate the trend toward globalization.

Contemporary Crime and the Police

Crime in Europe has certainly managed to keep pace with the developments outlined above. In addition to a considerable increase in all types of crime, organized international crime of a European style has, over the past 10 to 15 years, undergone an evolution, not only in scope but also in type, amount, and frequency. For example:

- The predicted Colombian cocaine bridgehead in Europe is well underway. The drug trade, in general, is flourishing throughout the continent,
- Environmental crime, fueled by powerful and wealthy business interests, is on the rise,
- International car theft rings are already taking advantage

of the crumbling Iron Curtain to expand territorial claims in the newly liberated countries of Eastern Europe. There is every indication that drug rings will also attempt to take advantage of the fallen Iron Curtain to expand into these markets,

- Terrorist groups, such as the Irish Republican Army (IRA), Red Army Faction (RAF) and Basque Fatherland and Liberty (ETA), no longer confine themselves to their own country, but operate from several Western European countries.

“Politicians must...see beyond their own borders and work to develop effective law enforcement strategies for the European community as a whole.”

Police cooperation in Europe has a long history. The necessity to unify against common enemies and international criminals was well understood 100 years ago and has since grown steadily.

Still, an effective continent-wide front against crime is severely hampered by the fragmented structure of many European police forces. Most are tied to antiquated legal rules and regulations not adjusted to today's crime.

Moreover, while a high degree of cooperation may occur in special cases, such as riots among rival football (soccer) supporters or investigations into internationally based criminal organizations, there still is lacking a comprehensive strategy to foster widespread cooperation.

Although some of the blame for this rests with the various police forces, unwilling to yield jurisdiction and resources, a large portion of responsibility for the failure to integrate more effectively lies with politicians. Many in Europe have either ignored or denied the need for increased police cooperation. The result is an uneven and spotty record of transborder enforcement.

Fortunately, the coming political, economic, and social changes provide a good opportunity to reevaluate the need for increased police cooperation throughout Europe. Politicians must foster the will to see beyond their own borders and work to develop effective law enforcement strategies for the European community as a whole.

Realistic Strategies

It must be understood that the planned elimination of internal borders was designed on the basis of furthering commercial opportunities and enhancing the economic status of European countries, individually and as a group. It was not necessarily intended to further the development of internal security or foster more effective international policing. Therefore, the various police agencies in Europe must work together to

capitalize on the opportunities made available to them by the 1992 agreement.

These potential opportunities, if not adequately addressed and planned for, could actually become obstacles to better policing. One thing is sure: The international criminal will be afforded new and different opportunities as a result of relaxed internal boundaries in Europe.

It should also be understood that the 1992 agreement, as it now stands, does not establish a "United States of Europe," nor is it likely to produce one in the near future. The agreement calls for no supranational governing body with legislative, executive, or judicial powers superceding those of the member countries. Nor does it establish anything resembling the federal system in the United States. For these reasons, and others, any discussion calling for the creation of a European-style FBI is premature. The more realistic approach is for existing police forces to develop new dimensions of cooperation.

It will also be helpful to remember the aspects of European life that will remain relatively unchanged after the 1992 agreement. The member nations will include:

- 12 different national cultures,
- 12 different monetary systems and 12 central banks,
- 12 different legal and judicial systems,

- 12 different national government administrations,
- 12 different police organizations, and
- 10 different languages.

Given these rather formidable differences, how are the different European police forces to go about forging closer relationships? One

"The international criminal will be afforded new and different opportunities as a result of relaxed internal boundaries in Europe."

clear answer is through joint training. Here, a cue can certainly be taken from the American model—the FBI's National Academy (FBINA) at Quantico, Virginia. In the past 20 years, some 200 police officers from 22 European countries have graduated from the FBINA. And, while this Quantico connection should remain an important training link across the Atlantic, creation of a European Police Training Academy is inevitable. This academy will serve not only to instruct but also to forge closer ties between

the different police forces of Europe. A joint research center should also be considered to consolidate resources and combine the scientific potential of the various nations.

CONCLUSION

While the 1992 agreement will have widespread impact on many facets of European life, its intrinsic effect on policing is not yet clear. As international crime rises, the path Europe chooses will have important consequences for many other countries. Although a comprehensive, federal-style, investigative agency is not yet a practicality—nor is it necessarily advisable in the near future—European police forces should embrace the spirit of cooperation and integration heralded by the 1992 agreement. The opportunities presented by this movement toward economic union will not be missed by the international criminal, and therefore, must not be missed by the European law enforcement community.

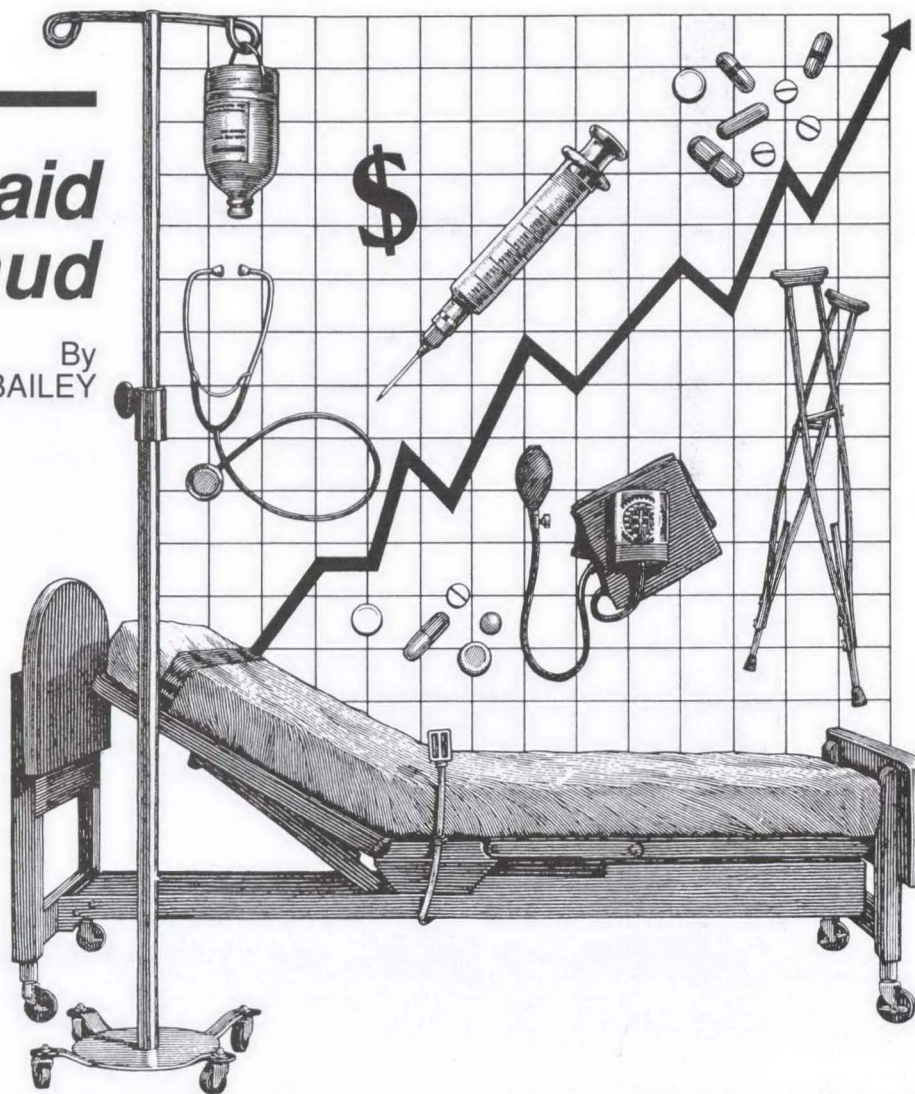
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Editor's Note: The 12 members of the European Economic Community (EEC) will move toward greater integration with an agreement, taking effect December 31, 1992, greatly reducing internal barriers between the member nations.

Point of View is a forum for law enforcement professionals to suggest recommendations to improve police work. Submissions for this feature should be typed, double-spaced, and forwarded to Editor, *FBI Law Enforcement Bulletin*, Room 7262, 10th & Pennsylvania Ave., NW, Washington, DC 20535.

Medicaid Fraud

By
LARRY L. BAILEY



In 1965, as part of Lyndon Johnson's Great Society, legislation was introduced to create the Medicaid Program. The program was designed to provide State-administered financing of medical services for needy families.

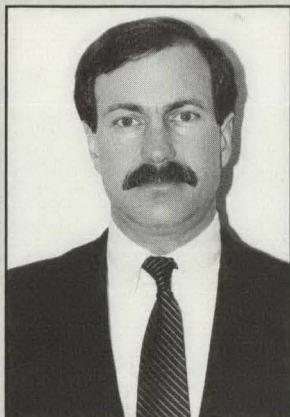
By 1977, Medicaid was a \$19 billion a year program, and it was estimated that fraud was costing taxpayers at least \$653 million annually. These losses threatened the integrity of Medicaid, and although the Medicaid Program is Federally monitored, the original

legislation did not specify who would investigate and prosecute any suspected cases of fraud. Therefore, Congress introduced legislation to form special Medicaid Fraud Control Units (MFCU).

Thirty-eight States currently have MFCUs. Most of the units are part of State attorney generals' offices, State bureaus of investigation, State police departments, State auditor generals' offices, or other similar agencies. Wherever these MFCUs are located, it is important that local, State, and Federal agencies know of their existence, their authority,

and their function. Many agencies are unaware that MFCUs exist, and as a result, opportunities to refer pertinent information to them or to combine investigative efforts with them are often overlooked. Therefore, law enforcement agencies should be aware of the functions of MFCUs and how these units can help them investigate Medicaid cases.

This article discusses what MFCUs are, how they work in conjunction with other law enforcement agencies, and how they can assist in local investigations that, were it not for MFCUs, might not otherwise



Mr. Bailey is Deputy Chief Investigator, Colorado Attorney General's Office, Medicaid Fraud Control Unit, Denver, Colorado.

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be pursued. It also illustrates how important it is for other law enforcement agencies to make timely referrals of possible crimes to MFCUs.

Purpose

MFCUs investigate and prosecute Medicaid fraud committed by doctors, psychiatrists, pharmacists, laboratories, hospitals, nursing homes, and medical equipment and supply companies. Personnel in the units also investigate suspected abuse of patients in Medicaid-subsidized facilities, ranging from simple assaults to sexual assaults or homicides.

For example, police are often called to nursing homes, where unattended deaths may appear to be of either natural or accidental causes. If foul play or negligence did occur, it is likely that the nursing home personnel would make untrue statements to officers and would falsify medical records to indicate that the person died of natural causes. To

further complicate the situation, doctors might sometimes certify the cause of death without a thorough examination of the body, much less an autopsy. They frequently draw their conclusions on the cause of death from statements of personnel at the facility. While the local police oftentimes do not have the experience or personnel to investigate such cases, MFCUs can investigate the possibility of a pattern of abuse or neglect of patients in a certain facility and may be able to establish a prosecutable case of negligent homicide. However, timely referrals by police to MFCUs is crucial, because if a victim is cremated, it is virtually impossible to prove that a crime has been committed.

Personnel

In most States, MFCU investigators are experienced, sworn peace officers who execute search and arrest warrants, participate in grand jury investigations, conduct

surveillances, and operate undercover. For example, investigators in the Colorado MFCU have, on the average, over 14 years' experience in law enforcement prior to beginning employment with the unit. In those States where MFCU investigators are not police officers, a sworn officer accompanies investigators whenever it is necessary to serve arrest or search warrants.

MFCU investigators who handle fraud cases that involve billing for services not performed, double billings, or kickbacks are assisted by auditors in the unit. These auditors are usually not sworn officers; however, some MFCUs do have police officers who are certified public accountants and also serve as unit auditors.

In addition to investigators and auditors, MFCUs oftentimes employ attorneys to prosecute Medicaid cases. Because the Federal Government contributes approximately 50 percent of the total Medicaid budget, it, as well as the States, is the victim of Medicaid fraud. For this reason, some of the lawyers are cross-designated as assistant U.S. attorneys. This allows them to file charges in Federal court rather than State court, which broadens the scope of potential offenses for which the defendants can be prosecuted. Federal charges in Medicaid fraud cases may include mail fraud, wire fraud, filing false claims, and violations of the Federal kickback statute.

Inter-Agency Cooperation

In States with large Medicaid programs, such as New York and California, single Medicaid fraud cases frequently range in the mil-

lions of dollars. Prior to the creation of MFCUs, this fraud went virtually unchecked. For example, one family used a medical clinic to obtain over \$30 million illegally from New York State. The family purchased a very expensive apartment in Manhattan and a mansion in Florida. They were routinely chauffeured in a limousine, and they enjoyed all the other amenities associated with wealth.

While the situation is now much improved, in order for MFCUs to be truly effective, it is important that other agencies notify them when there are possible fraud or patient abuse problems within their jurisdictions. The benefit of such inter-agency cooperation was clearly illustrated in a recent case in Colorado when investigators with the California Attorney General's Office advised their counterparts in Colorado that suspects from a recent California fraud case had moved to the Denver area, possibly to form a new company.

Investigators in the Colorado MFCU were able to determine that the suspects had, in fact, formed a new company in their jurisdiction. An MFCU investigator, who joined the company in an undercover capacity, quickly identified a pattern of fraud within the company, and he also learned that the suspects hoped to bribe a government official to obtain confidential information.

At this point, a local police department joined the investigation. It provided an additional undercover operative and electronic equipment, as well as detectives to operate the equipment and assist with the surveillance. This coopera-

tive effort resulted in the arrest of five suspects who were charged with 24 felony counts of bribery of a public official, conspiracy, and fraud, as well as the seizure of computers and an automobile. In addition, the company was put out of business before it could obtain large amounts of money through fraudulent activity. One defendant, who is cooperating with law enforcement officials, stated that company officials planned to bilk the system out of \$30 million during a 10-month period and then disappear.

In another cooperative effort, the Colorado MFCU worked with local police and the Drug Enforcement Administration (DEA) on the investigation of a pharmacist and a pharmacist/dentist who wrote prescriptions for controlled drugs and

Conclusion

Medical providers who cheat one program, such as a private insurance company, are likely to defraud other programs, such as Medicaid or Medicare. Medicaid Fraud Control Units are invaluable in the effort to reduce the number of Medicaid fraud and abuse cases.

MFCU personnel can access confidential information not available to those outside of their units, and through the use of MFCUs, law enforcement agencies can broaden the scope of offenses for which certain defendants can be charged. Unfortunately, however, because the existence of the units is not well-known, law enforcement agencies oftentimes fail to make use of this valuable asset. Therefore, it is imperative that police departments

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traded them for cocaine. They accounted for the controlled drugs by submitting false claims to Medicaid that indicated that the prescriptions were for Medicaid patients.

The MFCU assisted the police and DEA by reviewing Medicaid claims and other confidential information that is inaccessible to police officers who do not work in MFCUs. This joint effort resulted in the arrest and successful prosecution of both suspects on drug and Medicaid fraud-related charges.

educate themselves on MFCUs and how they can assist law enforcement agencies on the local, State, and Federal levels.

Medicaid Fraud Control Units may well be the key to stem the tide of Medicaid fraud and abuse, but it is impossible for them to be truly effective until they gain recognition within law enforcement agencies. Only then will they begin to make the considerable contribution of which they are capable.

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The Bulletin Reports

FM Body Transmitters

The Technology Assessment Program (TAP) of the National Institute of Justice recently released an equipment performance report entitled **Body-Worn FM Transmitters**. TAP develops minimum performance standards for law enforcement equipment and tests equipment based on these standards. Because body-worn FM transmitters are so critical to the success of many investigations and the safety of all those involved

in these investigations, users should know the performance capabilities of operations equipment to determine which best suits their needs.

This report contains the results of tests conducted on nine body-worn FM transmitters in accordance to the standards developed. It provides details of the test program, minimum performance requirements, and methods of testing, as well as the

individual test results, transmitter data sheets, and user information summary sheets.

A copy of this report can be obtained from the Technology Assessment Program Information Center, Box 6000, Rockville, MD 20850. The toll-free number is 1-800-248-2742. For callers in Maryland and the Washington, DC, metropolitan area, the number is 1-301-251-5060.

Law Enforcement Officers Killed—1990

The Uniform Crime Reports Section of the Federal Bureau of Investigation has released preliminary figures regarding the number of law enforcement officers killed during 1990. The statistics reveal that 65 officers were feloniously killed in the line of duty last year, which is the lowest total since the FBI began collecting these statistics in the 1960s.

Thirty-seven of the victims were city police, 16 were county officers, 5 were territorial officers, 4 were employed by State law enforcement agencies, and 3 were Federal officers. Sixteen officers were wearing body armor at the time of their murders, and 3 were killed with their own weapons. Law enforcement has cleared 63 of the 65 slayings.

Firearms continue to be the weapons most often used to kill

officers. In the 65 slayings recorded in 1990, handguns were used in 48 of the murders, rifles in 7, and a shotgun in 1. Three officers were stabbed, two were beaten with blunt objects, two were killed by personal weapons (hands, fists, feet), one was intentionally struck by a vehicle, and one was killed when his patrol boat was intentionally rammed by another.

Most of the officers killed (28) were attempting to apprehend or arrest suspects when slain. Among these 28 officers, 13 were attempting to thwart robberies or were in pursuit of robbery suspects, 4 were involved in drug-related situations, 1 was in pursuit of a burglary suspect, and 10 were attempting arrests for other crimes. Ten officers were answering disturbance calls when slain, and 9

were murdered while investigating suspicious persons or circumstances. Nine officers were ambushed, six were slain while enforcing traffic laws, two were slain while handling or transporting prisoners, and one was killed by a mentally deranged person.

The Southern States recorded the most officer killings with 30. There were 14 officers slain in the Midwestern States, 9 in the Western States, 7 in the Northeastern States, and 5 in Puerto Rico. In addition, 59 officers lost their lives because of accidents that occurred while they were performing their duties.

Source: Press release issued April 15, 1991, by the Uniform Crime Reports Section, Federal Bureau of Investigation, Washington, DC.

Arson Trends and Patterns

The National Fire Protection Association (NFPA) has released a report entitled *Arson Trends and Patterns—1989*. The report contains information on the incendiary and suspicious fires occurring within the United States. It is based on data received from the NFPA, the U.S. Fire Administration, and the Uniform Crime Reports Section of the Federal Bureau of Investigation.

Using charts, graphs, and tables, as well as written text, the report covers all facets of the arson problem in the United States. The report begins with information on structure, vehicle, and outdoor fires. It then addresses arson and suspected arson according to community size and clearances and arrests of arsonists. One section of the report is dedicated to the convictions, sentences, and motives of offenders, while another section looks at arson and suspected arson by property type and area of origin. The report concludes with a discussion of the four principal factors to consider when faced with this crime problem.

To obtain copies of this report, contact the Fire Analysis and Research Division of the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269, or call 1-617-770-3000.

Preliminary 1990 Crime Figures

According to preliminary annual statistics released by the Uniform Crime Reports Section of the FBI, serious crimes known to law enforcement rose 1 percent nationwide from 1989 to 1990. The data show that the number of violent crimes rose 10 percent last year, while the property crime total dropped 1 percent. The changes were measured by a Crime Index of selected violent and property offenses and were computed from data provided by law enforcement agencies across the Nation.

All violent crimes increased during 1990. Murder and aggravated assault both rose 10 percent; forcible rape was up 9 percent; and robbery increased 11 percent.

In the property crime category, motor vehicle theft increased 5 percent and arson, 1 percent.

Larceny-theft showed no change, while burglary declined 4 percent.

Regionally, 2-percent increases in the Crime Index total were recorded in the Northeastern States and the Midwestern States. While the Southern States showed no change, the Western States registered a 1-percent decrease.

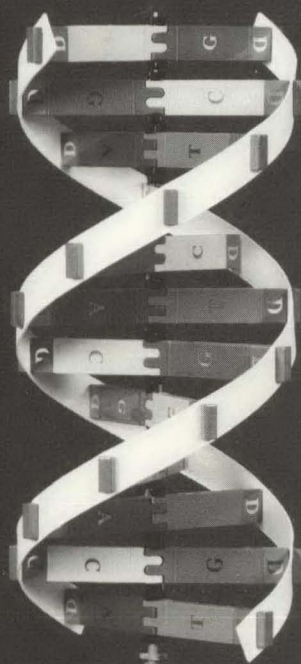
Similar to the national experience, the suburban areas and cities with populations over 50,000, as well as those outside metropolitan areas, each recorded 1-percent increases in the number of Crime Index offenses reported to law enforcement. The rural areas registered a 1-percent decrease for the same timeframe.

Source: Press release dated April 28, 1991, and issued by the Uniform Crime Reports Section, Federal Bureau of Investigation, Washington, DC.

The Bulletin Reports, a collection of criminal justice studies, reports, and project findings, is written by Kathy Sulewski. Send your material for consideration to: *FBI Law Enforcement Bulletin*, Room 7262, 10th & Pennsylvania Ave., NW, Washington, DC 20535.

(NOTE: The material presented in this section is intended to be strictly an information source and should not be considered as an endorsement by the FBI for any product or service.)

Judicial Acceptance of DNA Profiling



By
JOHN T. SYLVESTER, J.D.
and
JOHN H. STAFFORD, J.D.

Forensic DNA profiling has been under intense judicial scrutiny by the courts for over 2 years.¹ Even so, an overwhelming majority of the courts have admitted forensic DNA evidence after reviewing it under the

varying standards traditionally afforded novel scientific evidence. In doing so, the courts have recognized in numerous decisions that genetic profiles developed from an individual's DNA are reliable, probative, and objective.²

However, despite the many favorable decisions, DNA evidence, if challenged, must continue to undergo a pre-trial review, at least until a court of appeals in the jurisdiction in which the evidence is offered addresses the question of whether DNA evidence is acceptable. At such hearings, challenges to the evidence place at issue the ability of the forensic laboratories to match similar DNA profiles reliably, and thereafter, the ability to assess the frequency that the matched profile is expected to occur in the U.S. population. However, it is anticipated that with the continued strong support of the scientific community, prosecuting attorneys, and investigators, DNA profiling will soon be accepted by trial courts as routine evidence.

ADMISSIBILITY STANDARDS

Traditionally, two standards have been used to admit novel scientific evidence in U.S. courts. Specifically, courts have adopted either the "*Frye* standard" or the "relevancy standard" when deciding whether novel scientific evidence, such as DNA profiling, will be admitted for use in court.³

The *Frye* Standard

Courts applying the *Frye* standard will admit novel scientific evidence only after it has gained general acceptance in the pertinent scientific community.⁴ Accordingly, the court's role under *Frye* is more properly limited to an assessment of the extent to which the scientific community has embraced the technique as a whole.⁵ The analysis performed in any particular case is not generally at

issue in a *Frye* hearing.⁶ Rather, challenges pertaining exclusively to any one analysis are reserved for the jury, which may place less weight on the evidence if it concludes that the accepted testing procedures were not properly applied to the sample in the case.

The Relevancy Standard

As an alternative to the *Frye* standard, many courts have turned to the "relevancy standard" as the basis for determining whether the court will accept evidence that arises from new scientific techniques. The "relevancy standard" is based on the Federal Rules of Evidence and directs the court to consider the relevance,⁷ the potential for unfair prejudice, and the reliability of the offered testimony.⁸ The general acceptance of the technique by the scientific community is a factor in determining the admissibility of new scientific evidence, but it is not the overriding concern under this standard.

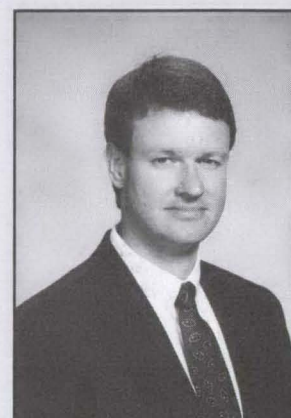
For example, evidence may be rejected under the relevancy standard, if the jury is asked to accept the expert's bare assertion on faith alone.⁹ In DNA profiling, an autoradiogram produces a permanent record of the results of this procedure and is available for review by the defendant and jury. The danger of a jury being asked to accept a scientific opinion on faith alone is thereby minimized.¹⁰

The *Castro* Standard

Recently, a New York trial court in *People v. Castro*¹¹ expanded these traditional approaches during its review of DNA evidence. After determining that forensic DNA pro-



Special Agent Sylvester



Special Agent Stafford

Special Agents Sylvester and Stafford are assigned to the DNA Task Force, Legal Counsel Division, Federal Bureau of Investigation, Washington, DC.

filings met the standards established under *Frye*, the court established a new precedent for the admissibility of DNA profiling evidence, not just to determine whether the DNA profiling technique is generally accepted but also to determine whether the technique was properly applied in the specific case before the court.

The defendant *Castro* was accused of murder. During the investigation, investigators obtained a speck of blood from the suspect's watch. The subsequent DNA analysis performed by a private laboratory associated the blood with that of the victim's. However, defense experts disputed the laboratory's interpretation of the test results, contending that the profile was uninterpretable or inconclusive.

The court became convinced that the private laboratory did not properly apply the accepted technique for DNA profiling in this case and excluded the evidence of a match from use at trial. Interestingly, the

defendant ultimately pled guilty, admitting the blood on his watch band was that of the victim's.

A few other courts have followed the approach of *Castro*.¹² A party introducing DNA evidence under this standard must now demonstrate at a pre-trial hearing that the laboratory properly performed the accepted scientific techniques in analyzing the forensic samples in the particular case.

JUDICIAL ACCEPTANCE

Forensic DNA profiling has been reviewed extensively by the courts under the varying standards afforded novel scientific evidence, and the number of favorable decisions is encouraging. An overwhelming majority of courts have admitted forensic DNA profiling results from the three major laboratories involved in forensic DNA analysis—the FBI, Cellmark, and Lifecodes. Courts in at least 49 States have admitted DNA evidence in over 417 hearings and

trials.¹³ The FBI Laboratory alone has accounted for admissions in over 120 trials and 85 separate admissibility hearings in 40 States.¹⁴ Moreover, 23 appellate level courts, including eight State courts of last

Therefore, the court excluded the evidence of the match as well. However, the court stated that it will consider evidence derived from DNA profiling in the future, assuming the offer of the population statistics is

“With few exceptions, Federal and State courts...have overwhelmingly admitted DNA test results, regardless of the admissibility standard used....”

resort, have reported favorable decisions after reviewing DNA profiling under the varying standards of review.¹⁵

Recently, however, a single State appellate court balked at recognizing DNA profiling, but left the door open to future admissions. In *Commonwealth v. Curnin*,¹⁶ the Supreme Judicial Court of Massachusetts reversed the trial court's admission of the DNA evidence analyzed by a private laboratory. The court observed that the offer of population statistics, which convey to the jury how common or rare the reported DNA profile is in the U.S. population, was not supported by testimony from an expert on population genetics. In the absence of such testimony, the prosecution could not demonstrate the general acceptance of the private laboratory's statistical approach to DNA analysis.¹⁷

Moreover, the court concluded that without the population statistics, the jury could not assess the significance of a DNA profile match.

properly supported by testimony from an expert qualified in the field of population genetics.¹⁸

A very few unreported trial court decisions have also rejected DNA profile evidence offered in a criminal proceeding.¹⁹ These courts have rejected DNA evidence for differing reasons, to include the existence of some dissent in the scientific community over some aspects of the approach to population statistics and the complexity of the evidence. However, the rulings that reject DNA evidence because of some divergence in the scientific community are clearly not consistent with the standards established by *Frye*. Because *Frye* requires only that the scientific technique be generally accepted in the scientific community,²⁰ some divergence in the scientific community is expected.²¹ These isolated adverse decisions have not generally been followed by other courts in the same jurisdictions that have admitted DNA evidence in criminal trials.²²

In a few other cases, trial and appellate courts have accepted testimony that two DNA profiles are consistent or “matched,” but then prevented the examiner from producing population statistics that would convey a sense of how rare the resultant profile is in the community in which the crime occurred. The examiner was allowed, however, to express an opinion on how rare or common the profile is based on the examiner's experience. These courts, in excluding testimony on population statistics, have voiced concern that such evidence might have a potentially exaggerated impact on the trier of fact.²³

United States v. Jakobetz

While no Federal appellate court decisions currently address whether forensic DNA profiling is judicially accepted, two of the more significant challenges to the forensic use of DNA profiling have been heard by two U.S. district courts.²⁴ The first published Federal opinion addressing the admissibility of the FBI's DNA test results was in *United States v. Jakobetz*.²⁵

In *Jakobetz*, the suspect was charged with kidnaping in the U.S. District Court in Vermont after he abducted the victim from an interstate rest area in Vermont, raped her, and then released her in New York. The DNA profile of semen obtained from the victim matched the DNA genetic profile of the suspect.

The defense in *Jakobetz* raised a substantial challenge to the admissibility of the forensic DNA evidence, attacking the reliability of the FBI Laboratory's procedure, as well as the use of population statistics in

the interpretation of the match. The population statistics produced by the FBI Laboratory indicated that the DNA profile of the defendant was extremely rare and was expected to occur only once in every 300 million persons. In a 35-page opinion finding general acceptance of the FBI's entire approach to forensic DNA testing, the court admitted the DNA profile for use by the jury, noting that the FBI used "fail-safe" characteristics in its approach to the population statistics that "redound to the defendant's benefit."²⁶

United States v. Yee

The most hotly contested DNA admissibility hearing held to date occurred in *United States v. Yee*.²⁷ The victim in *Yee* was shot 14 times at close range in his own van. He was apparently mistaken by his assailants as the leader of a rival gang. Blood enzyme tests on blood stains recovered from the van revealed that some of the blood was not consistent with that of the victim's, leading investigators to theorize that one or more of the rounds fired into the van ricocheted, hitting one of the attackers.

A DNA profile analysis performed by the FBI Laboratory comparing the blood recovered from the van and that of one of the defendant's resulted in a match. After a 6-week hearing, the U.S. magistrate issued a 120-page opinion recommending that the FBI's DNA test results be admitted.

The magistrate based his decision on the requirements of the *Frye* standard, finding that there is "general acceptance in the pertinent scientific community that the proce-

dures developed and implemented by the F.B.I. for determining that the DNA patterns from a known [i.e., a criminal suspect] source match with DNA patterns from a 'questioned' [i.e., crime scene] source are reliable."²⁸ He concluded also that there is general acceptance in the pertinent scientific community of the process used by the FBI in estimating the probability that such a match would randomly be encountered in the Caucasian population of the United States.²⁹

The U.S. District Court for the Northern District of Ohio subsequently adopted the magistrate's recommendation, recognizing the reliability of the evidence.³⁰ Several States have also recognized the inherent reliability and probative value of forensic DNA evidence and have passed statutes deeming it admissible in criminal prosecutions.³¹

**“
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”**

DEFENSE CHALLENGES TO ADMISSIBILITY

Major defense challenges are mounting in duration and magnitude as defense attorneys seek to counter the potential impact on the jury of forensic DNA profiling. These

challenges focus on bias, matching, and population statistics.

Bias

A few defense experts contend that the forensic test is biased against the suspect, since the examiner is aware of which samples the contributor expects will match. However, the fact is the FBI's DNA test results actually exclude the named suspects in about one-third of the submitted cases, often when traditional serological examinations had included the suspect as the potential source of the sample.³² These statistics are similar to those reported by other laboratories performing forensic DNA analysis.

Matching

Experts for the defense still challenge the ability of the forensic DNA laboratories to determine reliably a match given the deteriorated or degraded condition of most forensic samples. They contend that degraded samples cause the markers to shift during the processing of the sample to an unknown degree, possibly resulting in a false matching of samples. No court, however, has found these criticisms to be valid.

Population Statistics

The principle focus of current attacks is on the population statistics reported by the laboratory after a match has been established. Because the current application of the technology does not yet exclude one profile from that of every other person in the world, DNA profiling laboratories sample a portion of the population to determine how

common or rare certain DNA profiles occur in the population. From these data, the laboratory then develops a statistical estimate of how frequently a particular DNA profile is likely to appear in the U.S. population.

A few scientists have testified that the FBI has not sufficiently addressed the differences among ethnic subpopulations within a race, and therefore, cannot properly assess the resultant effect upon the statistical calculations provided for a match. However, only two trial courts have accepted the opinions of these experts in FBI Laboratory cases as representative of any significant part of the scientific community, and therefore, rejected the population data estimates provided by the FBI.³³

to develop data that are directly responsive to the issues raised in the pre-trial hearings.

This information continues to be disseminated to the appropriate community of scientists. As this information is disseminated more fully, the consensus of the community should be manifestly more apparent in favor of the FBI Laboratory's conservative use of population statistics in DNA profiling.

INVESTIGATIVE CONSIDERATIONS

While DNA profiling is fast gaining acceptance by the courts, investigators should be mindful that forensic DNA evidence does not yet positively identify the depositor of a biological sample. It is but one factor of identification and

For example, if the statistical probability arrived at by the examining laboratory is 1 in 70 (i.e., the odds that someone other than the defendant is the contributor of the sample in a particular case), the jury will be informed that the DNA profile, while a match to the defendant, is fairly common in the sampled community. The inference is that someone other than the defendant, even in a small community, could have been the contributor of the sample. Therefore, the association of the suspect and the crime scene sample will not be as strong as when the statistics indicate the profile is more rare. Accordingly, investigators cannot discount the need for traditional investigation to support a case for prosecution.

Also, investigators must be aware of the limitations of DNA analysis that will impact on the decision of whether a person should be excluded as a suspect in the crime. For example, a woman is raped, and some semen is recovered. But, suppose the DNA profile of the semen recovered does not match the DNA profile of the suspect. Is the suspect exonerated? Perhaps not.

Consider, for example, that the victim may have had recent, consensual sexual relations with her husband or a boyfriend before the rape occurred. The husband or boyfriend of the victim may be the sole contributor of the sample taken from the victim immediately after the rape, if the person responsible for the rape did not contribute a semen sample of evidentiary value. Consequently, the forensic DNA profile will not match the suspect's profile, but the absence of the sus-

“...DNA profiling is...but one factor of identification and cannot be relied upon alone to support a determination of innocence or guilt.”

However, this objection is not expected to persist. The great majority of courts reviewing DNA profiling evidence under the differing standards of review have considered the challenges to forensic DNA profiling and now recognize the technique as reliable and generally accepted by the scientific community. Moreover, the scientific community and the FBI Laboratory have developed and continue

cannot be relied upon alone to support a determination of innocence or guilt.

Given the current state of the technology, forensic DNA analysis is limited to determining whether the known biological sample from an individual is genetically similar to a questioned biological sample. Moreover, the relevance of a match or an exclusion varies depending on the circumstances in each case.

pect's DNA does not exclude the suspect.

Accordingly, when additional (non-DNA) evidence gives the investigator cause to believe that a particular suspect is responsible for the crime, despite the DNA test results that suggest the exclusion of the suspect, it is essential for the investigator to determine whether the victim had consensual sexual relations before the rape occurred. If so, a DNA sample should be obtained from that person for comparison to the forensic sample.

A match between the forensic profile and the husband's and/or boyfriend's profile indicates only that the DNA of the person believed responsible for the crime was not recovered from the victim. It follows that the principal suspect cannot be exonerated as the one who committed the crime on the basis of the DNA test results.

CONCLUSION

With few exceptions, Federal and State courts throughout the United States have overwhelmingly admitted DNA test results, regardless of the admissibility standard used by the particular jurisdiction. The RFLP (Restriction Fragment Length Polymorphism) technique, along with other newly emerging DNA technologies, has already begun to revolutionize personal identification in criminal cases.

As the courts continue to recognize the reliability and probative value of DNA evidence, the public will benefit greatly from increased efficiency of criminal investigations and trials. At some point in the not too distant future, DNA evidence

will be routinely admitted in criminal trials and will become as common as the use of fingerprints.

“Major defense challenges...focus on bias, matching, and population statistics.”

Moreover, advances in technology will allow for unique identification of suspects based on their genetic profiles, putting to rest entirely many of the criticisms based on the limitations of the current technology.

LEB

Footnotes

- ¹ See *People v. Wesley*, 533 N.Y.S.2d 643 (Sup. Ct. 1988) (the first reported decision passing on the admissibility of forensic DNA profiling).
- ² *State v. Wimberly*, 467 N.W. 2d 499 (S.D. 1991); *State v. Smith*, 807 P.2d 144 (Kansas 1991); *State v. Pennington*, 327 N.C. 89, 393 S.E.2d 847 (1990); *Caldwell v. State*, 260 Ga. 278, 393 S.E.2d 436 (1990); *State v. Ford*, 392 S.E. 2d 781 (S.C. 1990); *Spencer v. Commonwealth*, 240 Va. 78, 393 S.E.2d 609 (1990)(Spencer IV)(PCR); *Spencer v. Commonwealth*, 238 Va. 563, 385 S.E.2d 850 (1989)(Spencer III); *Spencer v. Commonwealth*, 238 Va. 295, 384 S.E.2d 785 (1989) (Spencer II), cert. denied, ___ U.S. ___, 110 S.Ct. 1171, 107 L.E.2d 1073 (1990); *Spencer v. Commonwealth*, 238 Va. 275, 384 S.E.2d 775 (1989) (Spencer I), cert. denied, ___ U.S. ___, 110 S.Ct. 759, 107 L.E.2d 775 (1990); *State v. Schwartz*, 447 N.W.2d 422 (Minn. 1989); *State v. Woodall*, 385 S.E.2d 253 (W.Va. 1989); *State v. Blair*, No. 2659, Slip op., unpublished (Ohio App. December 24, 1990); *State v. Lee*, No. 90CA004741, Slip op., unpublished (Ohio App. December 5, 1990); *Vickers v. State*, 801 S.W.2d 214 (Tex. App. 1990); *Snowden v. State*, 574 So.2d 960 (Ala. Crim. App. 1990); *Mandujano v. State*, 799 S.W.2d 318 (Tex. App. 1990); *Lopez v. State*, 793 S.W.2d 738 (Tex. App. 1990); *State v. Pierce*, No. 89-CA-30, un-

published (Ohio App. July 9, 1990); *Kelly v. State*, 792 S.W.2d 579 (Tex. App. 1990); *Perry v. State*, 568 So.2d 339 (Ala. Crim. App. 1990); *Glover v. State*, 787 S.W.2d 544 (Tex. App. 1990); *Andrews v. State*, 533 So.2d 841 (Fla. 5th Dist. Ct. App. 1988); *Martinez v. State*, 549 So.2d 694 (Fla. 5th Dist. Ct. App. 1989); *Cobey v. State*, 80 Md. App. 31, 559 A.2d 391 (1989), cert. denied, 317 Md. 542, 565 A.2d 670 (1989); *United States v. Yee*, 134 F.R.D. 161 (N.D. Ohio 1991); *United States v. Young*, 754 F.Supp. 739 (D.S.D. 1990); *United States v. Jakobetz*, 747 F.Supp. 250 (D.Vt. 1990); *State v. Pennell*, 584 A.2d 513 (Del. Super. Ct., 1989); *People v. Shi Fu Huang*, 145 Misc.2d 513, 546 N.Y.S.2d 920 (Sup. Ct., 1989); *People v. Castro*, 144 Misc.2d 956, 545 N.Y.S.2d 985 (Sup. Ct., 1989); *People v. Wesley*, 533 N.Y.S.2d 643 (Sup. Ct., 1988).

³ See Giannelli, "The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later," 80 Colum.L.Rev. 1197, 1200-01 (1980); *United States v. Downing*, 753 F.2d 1224, 1234 (3d Cir. 1985).

⁴ *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

⁵ *Id.*

⁶ *United States v. Gwaltney*, 790 F.2d 1378, 1382 (9th Cir. 1986).

⁷ See Fed. R. Evid. 401-403, 702-704.

⁸ *United States v. Williams*, 583 F.2d 1194, 1198 (2d Cir. 1978), cert. denied, 439 U.S. 1117, (1979); *United States v. Jakobetz*, 747 F.Supp. 250, 254-55 (D. Vt. 1990).

⁹ *United States v. Downing*, 753 F.2d 1224, 1234 (3d Cir. 1985).

¹⁰ *People v. Castro*, 144 Misc. 2d 956, 545 N.Y.S. 2d 985 (Sup. Ct. 1989).

¹¹ *Id.* at 987.

¹² *State v. Schwartz*, 447 N.W.2d 422 (Minn. 1989); *Caldwell v. State*, 260 Ga. 278, 393 S.E.2d 436 (1990).

¹³ See Congress of The United States, Office of Technology Assessment, Genetic Witness Forensic Uses of DNA Tests, July 1990, at 157 (hereinafter referred to as OTA).

¹⁴ Personal communication, DNA Analysis Unit, FBI Laboratory Division, April 30, 1991.

¹⁵ *Supra* note 2.

¹⁶ *Commonwealth v. Curnin*, 409 Mass. 218, 565 N.E.2d 440 (1991).

¹⁷ *Id.* at 443.

¹⁸ *Id.*

¹⁹ See, e.g., *State v. Wheeler*, No. C89-0901 (Or. Super. Ct., Washington County, March 8, 1990); *State v. Despain*, No. 15589, slip op. (Ariz. Cir. Ct., Yuma County, February 12, 1991); *State v. Fleming*, No. 90-CR-2716, slip op. (Ill. Cir. Ct., Cook County, March 12, 1991) (the decision is a consolidation of two rape cases *Fleming* and *State v. Watson*, No. 90-CR-5546, where the DNA admissibility hearings were combined).

²⁰ *People v. Castro*, 144 Misc. 2d 956, 545 N.Y.S.2d 920; see also *United States v. Yee*, 134 F.R.D. 161 (N.D. Ohio 1991).

²¹ *United States v. Yee*, 134 F.R.D. 161; *Commonwealth v. Lykus*, 327 N.E. 2d 671 (Mass. Sup. Ct. 1975).

²² Subsequent to *Wheeler*, *supra* note 19, FBI DNA test results were admitted in the same county in *State v. Herzog*, Nos. C89-0738, C890739, C890691 (Or. Super. Ct., Washington County, admitted on May 4, 1990). Prior to *Despain*, *supra* note 19, FBI DNA test results were admitted in *State v. Medina-Gonzalez*, No. CR27078 (Ariz. Super. Ct., Pima County, admitted on November 27, 1990). Since *Fleming*, *supra* note 19, FBI test results were admitted in Illinois in *People v. Stremmel*, No. 90-CF-1024 (Ill. Cir. Ct., Winnebago County, admitted on May 2, 1991); *See also State v. Mehlberg*, No. 89-CF-61 (Ill. Cir. Ct., Montgomery County, admitted on August 31, 1990); *State v. Smith*, No. 90-CF-42 (Ill. Cir. Ct., Ogle County, December 6, 1990). DNA test results have also been admitted in Oregon, Arizona, and Illinois by Lifecodes and Cellmark. *See* OTA, *supra* note 13, at 158-172 for listing of State DNA admissions.

²³ *See, e.g., Caldwell*, *supra* note 12 (Lifecodes' statistics reduced); *State v. Pennell*, 584 A.2d 513 (Del. Super. Ct. 1989) (Cellmark's statistics excluded); *People v. Wesley*, 140 Misc.2d 306, 533 N.Y.S.2d 643 (1988) (Lifecodes' statistics reduced); *United States v. Martinez*, No. CR90-10021-01, (D.S.D., testimony on January 9, 1991) (statistics prejudicial based on prongs set forth in the now

vacated *Two Bulls* decision); *State v. Nelson*, No. IK89-09-0882 slip op. (Del. Super. Ct., Kent County, December 4, 1990) (statistics potentially prejudicial and confusing to jury); *State v. Jobe*, No. 88903565, slip op. (Dist. Ct., Hennepin County, Minn., September 6, 1990) (statistics of individual allele frequencies admitted but statistics derived from multiplication of frequencies disallowed because of previous State supreme court decision discouraging the use of statistics because of their prejudicial effect).

²⁴ *United States v. Yee*, *supra* note 2; *United States v. Jakobetz*, *supra* note 2; *but see United States v. Two Bulls*, 918 F.2d 56 (8th Cir. 1990) (ruling vacated 2-21-91 *en banc* review granted) rejected DNA evidence using the criteria from the *Castro* decision. However, as noted, the Eighth Circuit Court of Appeals has since vacated the opinion. Moreover, no review of the decision will be forthcoming from the court as Mr. Two Bulls recently died.

²⁵ *United States v. Jakobetz*, 747 F. Supp. 250, 254-55 (D.Vt. 1990).

²⁶ *Id.* at 256.

²⁷ *United States v. Yee*, 134 F.R.D. 161 (N.D. Ohio 1991) (order affirming magistrate's recommendation, with addendum for magistrate's recommendation); *United States v. Yee*, No. 3:89CR720, slip op. (N.D. Ohio, February

1, 1991) (order denying defendant's motion for rehearing on DNA admissibility); *United States v. Yee*, 129 F.R.D. 629 (N.D. Ohio 1990) (magistrate's discovery order).

²⁸ *Id.*

²⁹ *Id.*

³⁰ *United States v. Yee*, 134 F.R.D. 161.

³¹ Ind. Code § 35-37-4-10 (1990); La. Rev. Stat. Ann. § 15:441.1 (West 1991); Nev. Rev. Stat. § 56.020 (1989); Md. Cts. & Jud. Proc. Code Ann., § 10-9 (1989); Minn. Stat. § 634.25-.26 (1990); Va. Code Ann. § 19.2-270.5 (1990).

³² Personal communication, DNA Analysis Unit, FBI Laboratory, May 4, 1991.

³³ *See State v. Despain*, No. 15589, Slip. op. (Cir. Ct. Yuma County, Ariz. February 12, 1991) and *State v. Watson*, No. 90-CR-5546, Slip. op. (Cir. Ct. Cook County, Ill. March 12, 1991).

Law enforcement officers of other than Federal jurisdiction who are interested in this article should consult their legal advisor. Some police procedures ruled permissible under Federal constitutional law are of questionable legality under State law or are not permitted at all.

Author Guidelines

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Length: 1,000 to 3,000 words or 5 to 12 pages double-spaced.

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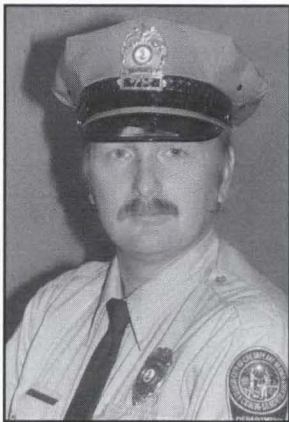
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The Bulletin Notes

Law enforcement officers are challenged daily in the performance of their duties; they face each challenge freely and unselfishly while answering the call to duty. In certain instances, their actions warrant special attention from their respective departments. The *Bulletin* also wants to recognize their exemplary service to the law enforcement profession.

While driving home from duty, Officer Grover Franklin Davis of the Chesapeake, Virginia, Police Department responded to the report of a domestic dispute at an area restaurant. A man was holding his wife at knifepoint and threatening to harm her. After helping to evacuate the other patrons and employees, Officer Davis positioned himself strategically, while two other responding officers attempted to negotiate with the subject. When the suspect struck the woman in the face with his knife, Officer Davis fired a shot before he could inflict any more damage. The suspect later died of his injuries; the woman was treated at a local hospital and released.



Officer Davis



Special Agent Wilson

Special Agent Flora A. "Sally" Wilson of the Naval Investigative Service, San Diego, California, Resident Agency saved the life of an individual who was threatening to jump from the 6th-floor ledge of a building. Agent Wilson first engaged the subject in conversation, using her crisis management skills to calm him. However, when she believed that the subject appeared ready to jump, Agent Wilson, placing herself at risk, pulled him to partial safety until assistance arrived moments later.



Patrolman Uranyi

Patrolman Edward A. Uranyi of the Chatham Borough, New Jersey, Police Department became involved in a pursuit of a four-wheel drive vehicle that was attempting to avoid apprehension, when the operator drove over a curb and onto a State highway. The subject then made a U-turn and began driving in the wrong direction, colliding head-on with a patrol car from another jurisdiction. When Patrolman Uranyi came upon the scene a few moments later, he immediately entered the demolished patrol car and administered first aid to the seriously injured officer, saving his life.

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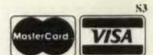
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