

# The Compiler

Illinois Criminal Justice Information Authority

Spring 2001

## Inside

### Features

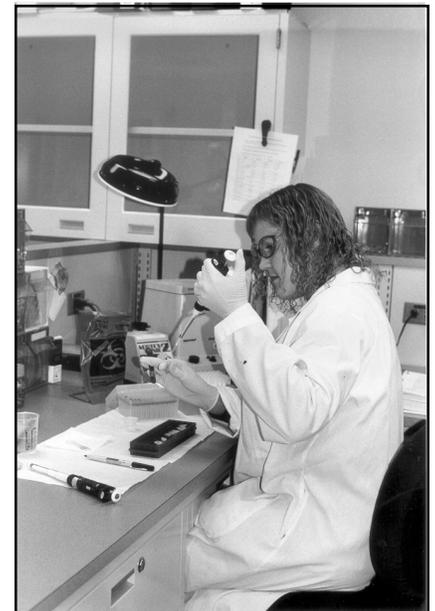
Lab resources aren't keeping up with demand	4
Addressing the DNA backlog	7
Fingerprinting remains on cutting edge	9
Chemistry lab work reflects drug operations	11
Program improves sexual assault evidence collection	13
Ballistics system matches fired bullets with guns	15
Crime scene investigation	17

### Departments

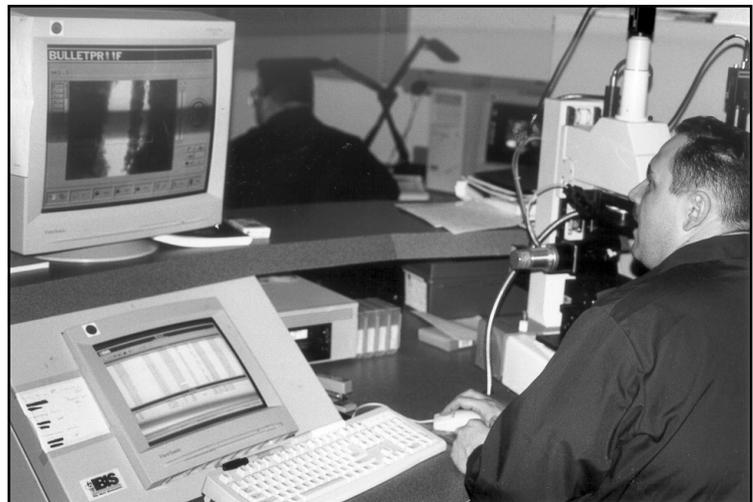
In brief	2
Technology	19
Trends	20

## State crime labs struggle to keep up with demand

The criminal justice system is relying more than ever on DNA analysis and other forensic techniques, but lab resources haven't kept pace. Inside, a look at some trends in forensic science and the work of forensic laboratories.



*At the Illinois State Police Forensic Science Center at Chicago, a forensic scientist (right) extracts DNA, while a ballistics technician (below) analyzes microscopic markings on a bullet.*



Published by the Illinois Criminal Justice Information Authority.

**George H. Ryan**  
Governor



**Candice M. Kane**  
Executive Director

### Statutory members of the Authority

**Dorothy Brown**  
Clerk of the Circuit Court  
Cook County

**John J. Millner**  
Chief  
Elmhurst Police Department

**Timothy F. Bukowski**  
Sheriff  
Kankakee County

**Sam W. Nolen**  
Director  
Illinois State Police

**Richard A. Devine**  
State's Attorney  
Cook County

**Jim Ryan**  
Illinois Attorney General

**Norbert Goetten**  
Director, Office of the State's  
Attorneys Appellate Prosecutor

**Michael Sheahan**  
Sheriff  
Cook County

**Terry G. Hillard**  
Superintendent  
Chicago Police Department

**Donald N. Snyder Jr.**  
Director  
Illinois Department  
of Corrections

**Maureen A. Josh**  
Clerk of the Circuit Court  
DeKalb County

**Michael Waller**  
State's Attorney  
Lake County

**Thomas J. Jurkanin**  
Executive Director  
Illinois Law Enforcement Training  
and Standards Board

### Members of the public appointed to the Authority

**Peter B. Bensinger, Chairman**

**Albert A. Apa**

**Barbara Engel**

**Jane Rae Buckwalter**

**John Piland**

---

Produced by the Office of Public Information

**EDITOR**  
**Daniel Dighton**

**ASSISTANT EDITOR**  
**Cristin Monti**

---

Created in 1983, the Illinois Criminal Justice Information Authority is a state agency dedicated to improving the administration of criminal justice. The Authority works to enhance the information tools and management resources of state and local criminal justice agencies, and it serves as a statewide forum for criminal justice coordination, planning, and problem solving. It also is responsible for research, information systems development, and administration of federal anti-crime funds. The Authority's specific powers and duties are spelled out in the Illinois Criminal Justice Information Act [20 ILCS 3930/1 et seq.].

The Illinois Criminal Justice Information Authority is governed by an 18-member board of state and local leaders from the criminal justice system, plus experts from the private sector. Authority members help develop priorities and monitor their progress. The agency's day-to-day work is carried out by a full-time professional staff working out of the Authority's Chicago office.

Copyright © 2001 Illinois Criminal Justice Information Authority. All rights reserved. Opinions and positions expressed herein are not necessarily those of the Illinois Criminal Justice Information Authority. Permission to use parts or the whole publication may be obtained by writing or calling the Illinois Criminal Justice Information Authority, Office of Public Information, 120 South Riverside Plaza, Suite 1016, Chicago, IL 60606-3997; (312) 793-8550; fax (312) 793-8422. Reader comments are welcome.

E-mail Editor Daniel Dighton at <ddighton@icjia.state.il.us>

Printed by authority of the State of Illinois, May 2001. Printing order number: 01-296.  
Number of copies: 7,000. ISSN 1059-6569. Printed on recycled paper with soybean-based ink.

## Funds to help expand treatment services for juvenile offenders

Gov. George H. Ryan recently announced a statewide \$3.7 million substance abuse initiative to expand treatment services for juveniles involved with the criminal justice system. Administered by the Illinois Department of Human Services (DHS), the initiative will rely on interagency collaboration between DHS's Office of Alcoholism and Substance Abuse, the Department of Corrections, the Administrative Office of the Illinois Courts, local court and probation systems, and substance abuse treatment providers.

The goal of the initiative is to establish a system for assessment and placement within community substance abuse treatment programs. Services will include a full continuum of care, including recovery homes and models of treatment unique to youth leaving the corrections system and re-entering their communities.

## New Web site helps research

Access to the latest criminal justice research was made easier with the introduction of an updated National Criminal Justice Reference Service (NCJRS) Web site. NCJRS is a key Internet source for information on current research in criminal justice, juvenile justice, and drug policy.

The new site, [www.ncjrs.org](http://www.ncjrs.org), offers improved organization through streamlined criminal justice topics, a new feature for comprehensive research on selected issues, and the latest justice research findings. The site also offers a comprehensive database containing more than 160,000 citations and abstracts to criminal justice works, and more than 1,500 full-text online publications.

## Helping Paws benefits many in Illinois

The new Helping Paws Service Dog Program at the Dwight Correctional Center brings together an unlikely group of Illinois residents while enhancing their lives. The Illinois Department of Corrections (IDOC), in collaboration with the Clarence Foundation and Lake Land College, implemented Helping Paws to rescue dogs, bring them to the correctional facility for training, and place them with people who have special needs. Female inmates at the Dwight Correctional Center learn to care for the dogs and train them to perform a variety of services, such as turning off lights, retrieving objects, and opening cabinets. Once the animals have mastered the tasks, they are placed in homes across the state at no cost to their new owners.

The Clarence Foundation rescues dogs from streets and shelters. The animals are medically cared for, and then sent to the correctional facility. While the dogs are learning to be of service, inmates are educated about grooming and training. Inmates who successfully complete the program become licensed dog groomers through Lake Land College. If the dogs make the grade, they are sent to help a new, loving owner with routine tasks.

"Helping Paws is transforming lives — both human and canine," said Donald Snyder, IDOC director.

## Two Illinois counties honored for traffic safety

Will and Livingston county sheriff's offices have been honored for their work in traffic safety by the International Association of Chiefs of Police. The Will County Sheriff's Office placed first in the Chief's Challenge Competition among departments with 101 officers and above. The Livingston County Sheriff's Police was a first place winner in the chief's competition among departments with 26-50 officers.

The IACP, in cooperation with the National Highway Traffic Safety Administration and the National Sheriff's Association, sponsors the annual competition to encourage maximum safety belt use and impaired driving enforcement. Departments are judged on criteria such as operational guidelines regarding all traffic enforcement activities, the type and quality of officer training in traffic safety subjects, public education efforts, and enforcement activities.

## Drug court conference

The Illinois Association of Drug Court Professionals (IADCP) will sponsor its Second Annual Conference Sept. 25 at the Holiday Inn in Matteson. The IADCP is a statewide organization comprised of judges, prosecutors, defense attorneys, court administrators, probation officers, law enforcement and correctional officers, alcohol/drug treatment professionals, and community activists who work in, or have an interest in, treatment-based drug courts. For conference or membership information, call Susan Stanger at (773) 869-5127.

## Federal fiscal year grants designated

The Authority received designations for several grants from the U.S. Department of Justice for federal fiscal year 2001.

The **Residential Substance Abuse Treatment (RSAT)** program received \$1.84 million to continue providing assistance to state prisoners. The Illinois Department of Corrections will receive most of these funds. RSAT programs must provide treatment for six to 12 months, offer services in a residential setting away from the general inmate population, focus on substance abuse, and develop inmates' social, cognitive, behavioral, and vocational skills.

The Authority received \$19.7 million under the federal Anti-Drug Abuse Act (ADAA), also known as the **Edward Byrne Memorial State and Local Law Enforcement Assistance Program**. Byrne funds support government programs that enable the enforcement of Illinois drug laws and help decrease violent crime.

The Authority received \$15.1 million to administer **Victims of Crime Act (VOCA)** programs in Illinois. Funded with fines paid by those convicted of violating federal laws, VOCA supports direct services to victims of violent crime. The act requires that priority be given to services for victims of sexual assault, domes-

tic abuse, child abuse, and other groups identified by the state as underserved victims of violent crime

Illinois received \$4.1 million under the **Violence Against Women Act (VAWA)**. VAWA funds are used to improve the response of the criminal justice system to victims of sexual assault and domestic violence.

The Authority received \$8.6 million for the **Juvenile Accountability Incentive Block Grant (JAIBG)** program, which was enacted in 1998 to promote greater accountability in the juvenile justice system. JAIBG funds can be used for initiatives such as programs designed to enable prosecutors to address drug, gang, and youth violence problems more effectively, and programs establishing and maintaining interagency information-sharing capabilities.

The Authority had \$1 million to distribute under the **Local Law Enforcement Block Grants** program and was able to fund proposals from 66 agencies, 63 of which received LLEBG funds for the first time. The Authority received 350 proposals for LLEBG funds, seeking more than \$5 million. The grants are for equipment for officer safety and basic law enforcement operations.

## Racial and ethnic justice national forum slated

The National Criminal Justice Association National Forum 2001, "...And Justice For All — Creating Racial and Ethnic Justice in America", will take place July 30 and Aug. 1 at the Hilton Sedona Resort in Sedona, Ariz. The conference will aim to assist public officials in making informed policy decisions concerning programs and procedures to create racial and ethnic justice in all facets of state and local criminal justice and judicial systems. For registration information, contact the NCJA at (202) 624-1440.

## Authority staff contribute to criminal justice journal

An article written by Authority Associate Director Gerard F. Ramker and Senior Research Scientist David E. Olson appeared in the most recent issue of *The Justice System Journal*, (Volume 22, Number 1, 2001).

The article, "Crime Does Not Pay, But Criminals May: Factors Influencing the Imposition and Collection of Probation Fees," summarizes the findings of a study of 2,400 adults on probation in Illinois.

*The Justice System Journal* is a publication of the National Center for State Courts. An earlier version of "Crime Does Not Pay, But Criminals May: Factors Influencing the Imposition and Collection of Probation Fees" was presented at the Annual Meeting of the Midwestern Criminal Justice Association in October 1999. ■

# State police lab system resources aren't keeping up with increasing demand

By Daniel Dighton

Nearly 20 years ago, the regional crime laboratories of the Illinois State Police were recognized leaders in the field of forensic science, becoming the first state crime lab system in the country to be accredited. Today, the laboratories are still top-notch, but their ability to keep up with the increasing demand for forensic services is being threatened by chronic staffing shortages and aging facilities.

Gov. George H. Ryan recently recognized this situation in his proposed fiscal year 2002 budget, earmarking \$1.5 million to hire forensic scientists and lab personnel. The funding is intended to address backlogs in the processing of evidence, especially in DNA testing, within the state's lab system.

"My proposed budget recognizes the important link between overall public safety and timely access to the latest technical advances in forensic science," Ryan said in announcing his budget.

The additional funding would allow the state police labs to hire 80 people, most of them to be trained as forensic scientists and lab technicians.

"That will be a tremendous help," said ISP Deputy Director Teresa Kettelkamp, head of the Division of Forensic Services.

## The need for more resources

ISP administrators have predicted that without additional resources state police crime labs could be completing less than

50 percent of their cases in a timely manner by 2002. There simply is not enough staff to keep up with the increasing workload.

A couple of factors have had a large impact on the current trend. For one, police agencies simply have been improving their investigative capabilities and collecting more evidence for analysis at the ISP labs. An even bigger reason for the increased workload is that five years ago the state police assumed responsibility for the Chicago Police Department's forensic laboratory work.

The Forensic Science Center at Chicago opened on July 1, 1996, as the eighth, and by far the largest, ISP lab in the state. The Chicago Forensic Science Center accounts for more than half of all case submissions to ISP labs. The workload statewide for the labs has in-

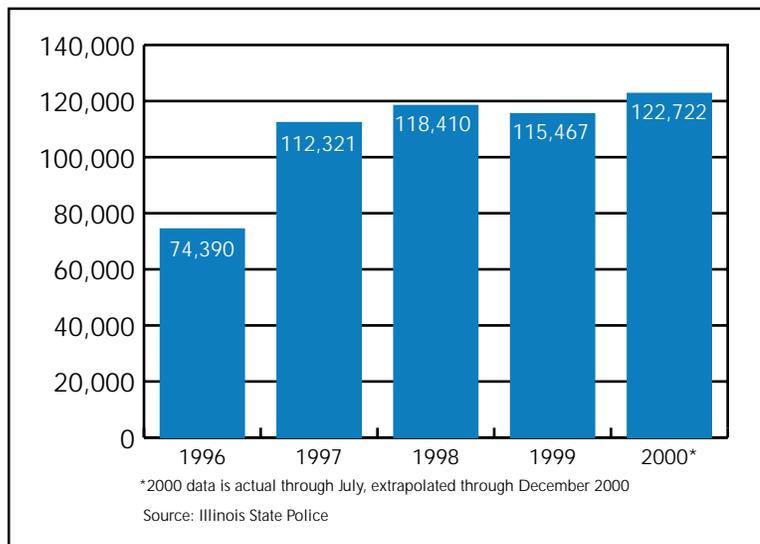
creased sharply since then, but the size of the laboratory analytical staff has not kept pace.

In 1996, ISP labs had 269 forensic scientists and trainees. These analysts handled 74,390 cases, for an average of 277 cases per analyst. By 2000, there were about 30 more analysts statewide, but they handled 122,722 cases, for an average of 412 cases per analyst (Figures 1-3). Meanwhile, the number of overtime hours worked increased dramatically, and the percent of cases completed within established time standards fell steadily.

## Crime labs have long history

Crime labs in Illinois have a long history. The first police crime lab in Illinois was established in Chicago as a result of the gangster wars of the Prohibition era. The

Figure 1  
Case activity at ISP labs



*Daniel Dighton is a public information officer with the Authority.*

direct catalyst was the notorious St. Valentine's Day Massacre of 1929.

When seven members of "Bugs" Moran's gang were cut down in a barrage of gunfire in a garage on North Clark Street, witnesses reported seeing police officers leaving the building. Part of the subsequent investigation focused on whether police officers had been involved. A nationally recognized expert on firearms was called in to examine the recovered bullets and compare them to Thompson sub-machine guns used by Chicago police. It was determined that police weapons did not fire any of the bullets involved in the massacre, and the police impersonators at the crime scene were later linked to Al Capone's gang.

Members of the grand jury investigating the massacre were so impressed by the testimony of the expert witness on firearms, Col. Calvin Goddard, that they recommended the creation of a scientific crime laboratory in Chicago. The first Chicago crime laboratory opened in June 1929 in a wing of the Northwestern University Law School.

The Chicago Police Department assumed full responsibility for the lab in 1938. CPD operated the lab until turning those duties over to the Illinois State Police when the new Forensic Science Center at Chicago opened on Roosevelt Road in 1996.

Today, the lab handles about 60,000 pieces of evidence a year, with roughly 80 percent of those items being drugs. Every day, some 200 to 400 pieces of evidence arrive at the lab. Each piece must be electronically scanned using a bar code system, which is used to track it throughout the lab and maintain the chain of custody.

## Statewide lab system

In addition to the Chicago Forensic Science Center, there are state police labs in Carbondale, Fairview Heights, Joliet, Morton, Rockford, Springfield, and Westchester (map). There also is a Research and Development lab in Springfield, and there are training labs at several facilities.

Although every lab does not do work in all areas, the state lab system conducts forensic analyses across several disciplines, including:

**Drug Chemistry** — to determine if evidence contains controlled substances or cannabis.

**Toxicology** — to identify drugs or poisons in tissue, blood, urine, or other body fluids.

**Trace Chemistry** — to identify and compare traces of evidence from arsons, explosions, accidents, and non-drug related cases.

Figure 2

Analytical staff at ISP labs  
(including trainees)

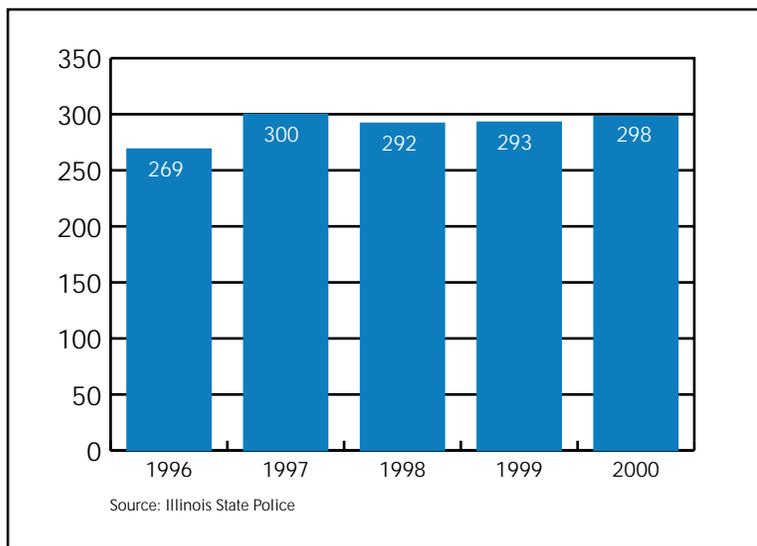
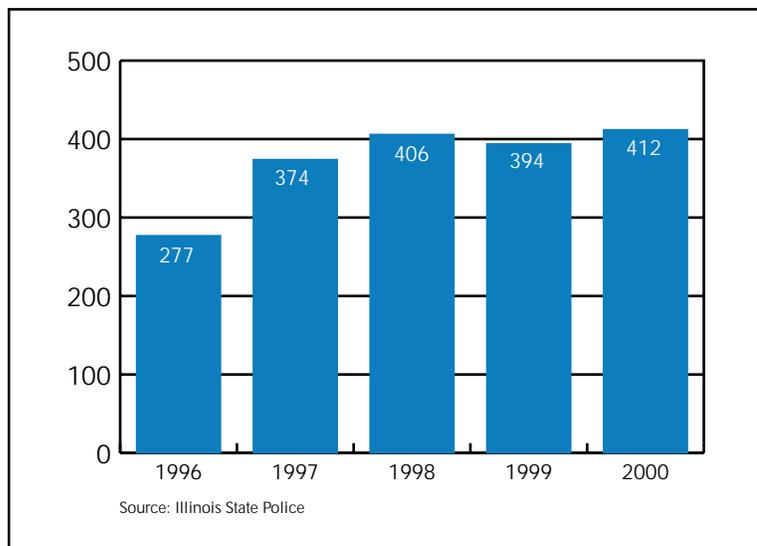


Figure 3

Average cases worked per analytical staff  
(including trainees)



**Microscopy** — to obtain enlarged images of small objects, such as hairs, fibers, woods and building materials.

**Forensic Biology/DNA** — to identify and compare body fluids and other biological matter through DNA analysis.

**Latent Prints** — to find and compare prints left at crime scenes with those of potential suspects.

**Firearms** — to determine if specific bullets, cartridges, or firearms can be related to particular crimes.

## Lengthy training

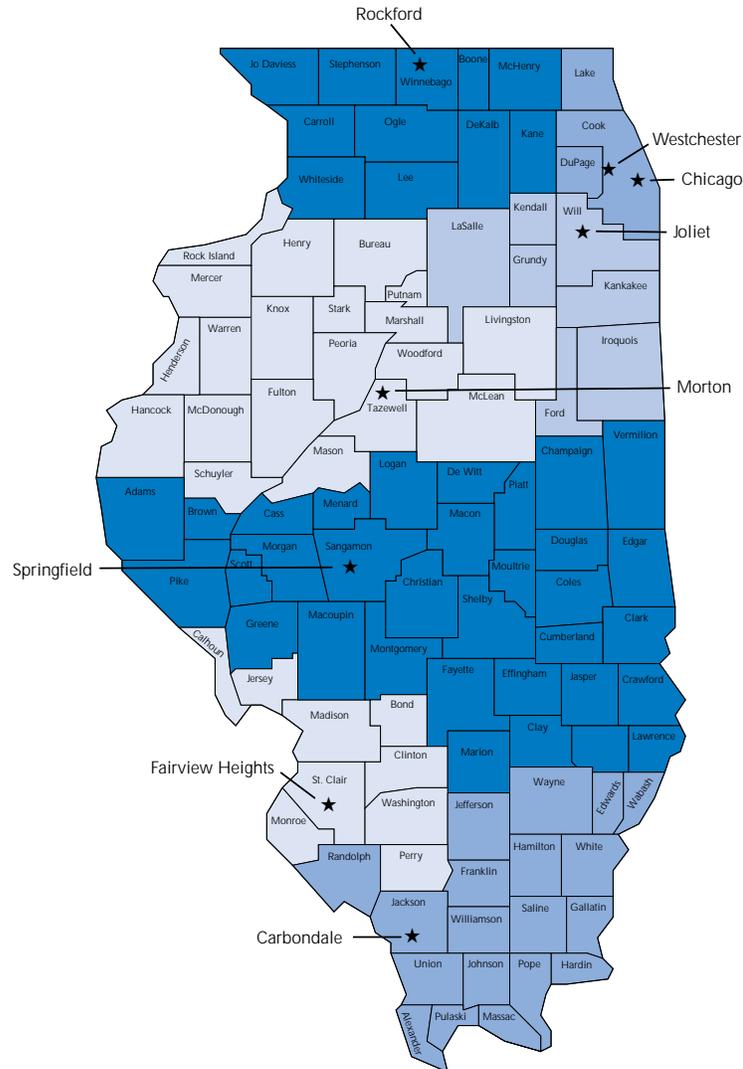
Forensic scientists at the state's labs are recruited from the ranks of college science major graduates. They must then undergo extensive training at an ISP lab, which can take anywhere from 12 to 36 months, depending on the specialty. Training for forensic scientists working with DNA and crossed trained as forensic biologists, one of the areas of greatest need, takes about two years, Kettelkamp said.

It is not uncommon for the state police to train forensic scientists and then see them leave a short time later for higher paying laboratory jobs in the private sector or with another government agency. This presents a hardship for the lab system as it struggles to keep positions filled and continuously train new scientists. It is also difficult to keep an adequate number of instructors in the various disciplines.

One thing ISP administrators are considering to address the turnover problem is a requirement that recruits agree to stay with ISP after they finish training for at least as long as their training lasted.

Another plan is to adjust the pay grade steps and create a category for forensic scientist administrators. Because

## ISP Regional Laboratories



forensic scientists can get overtime pay, they can easily end up earning more money than managers who do not qualify for overtime, making it difficult to fill management positions, Kettelkamp said.

Until 1995, most of the training for analysts was conducted at the Southern Illinois Forensic Science Centre in Carbondale. The only exception was toxicology, which was taught in Springfield. But in 1995, the classes for new employee training became too large to be accommodated at the Carbondale facility. Now, an orientation is conducted in Carbondale and subsequent training is done there and at other regional labs.

Kettelkamp said one of her goals for the lab system is to consolidate all training at a forensic science institute in Spring-

field. Such a facility could accommodate all initial training as well as ongoing in-service training. It could also serve as a Midwest training center for FBI classes offered to law enforcement agencies, she said.

## Outdated facilities

The condition of the laboratory facilities is another issue that ISP wants to address and improve over the next few years. Of the eight regional laboratories in the system, only the facilities in Chicago, Morton, Joliet (second floor), and Rockford were constructed as laboratories. The first floor of Joliet was converted from business offices, as were the labs in Springfield and Westchester, and the Research and Development lab in Springfield. The facility in Carbondale had previously been a college dormitory, and the one in Fairview Heights was a tuberculosis sanatorium.

Several facilities suffer from being either too small, or they have inadequate heating, ventilation and air conditioning, which is crucial to the sensitive nature of the equipment and the tests at the laboratories.

“It takes some special expertise to build a facility as a forensics lab,” Kettelkamp said.

Today, even though Chicago is fairly new and an exceptional facility, it is too small and needs to be expanded. “It was built too small to begin with,” Kettelkamp said. ISP originally wanted a 120,000-square-foot facility in Chicago, but got a building with only 85,636 square feet. Plans are now under way for expansion of the lab. ■

# State seeks to reduce DNA backlog

By Cristin Monti

**T**he use of DNA has become one of the most powerful methods of crime solving. But while DNA testing is on the rise within the criminal justice system, resources haven't kept up with demand.

"Success generates more emphasis on the use of DNA technology," said Kathleen Stevens, assistant deputy director of the Illinois State Police's Division of Forensic Services. "This emphasis causes a substantial increase in case submissions."

The fundamental building block of a human's entire genetic makeup, DNA, or deoxyribonucleic acid, contains components of nearly every cell in the human body. It can be detected in blood, semen, skin cells, tissue, organs, muscle, brain cells, bone, teeth, hair, saliva, mucus, perspiration, fingernails, and other biological matter, and is the same in every cell of the body.

## Rapid growth in cases

DNA technology instills a heightened sense of justice in the community as the unjustly accused are exonerated and the truly criminal are convicted. Illinois State Police DNA case submissions increased nearly 35 percent between 1999 and 2000.

"The success of DNA has led to an expectation on the part of the criminal justice community to look for DNA evidence first at a crime scene, rather than relying on other forms of physical evidence and investigative leads as in the past," Stevens said.

---

*Cristin Monti is a public information officer with the Authority.*



Photo by Daniel Dighton

***Forensic Scientist Tanis Wildhaber conducts a DNA extraction in a training lab at the ISP's Forensic Science Center at Chicago.***

---

The normal annual caseload growth rate in most other forensic disciplines is between 6 and 8 percent, and it is unknown whether the trend of increasing DNA analysis will continue, she said.

In December 2000, about 1,270 ISP cases were backlogged for DNA analysis of sexual assault evidence. State police officials said with current staffing limitations, it could take up to 17 months to process these cases, provided no new DNA cases were received. Federal grant funding has been allocated by the Authority to outsource many of these cases to private labs to help reduce the backlog.

## National database

Using database technology, DNA evidence taken from separate crime scenes can be matched nationally and statewide. The Combined DNA Index System (CODIS) is used to generate suspects in unsolved cases and identify serial cases. CODIS is the FBI's national DNA database. It is made up of three components: a forensic database that contains DNA profiles from semen and blood stains from a crime; a population database that can match DNA profiles; and an offender database of DNA information from individuals who have been convicted of legislatively specified offenses.

All DNA samples taken from crime scenes are entered into CODIS. Illinois forensic labs also have access to a state database through CODIS.

## Increased funding

A criminal justice plan for Illinois drafted by the Authority calls for increased funding of DNA initiatives. In addition, Gov. George H. Ryan earmarked \$1.5 million of the state fiscal year 2002 budget to hire additional scientists and laboratory personnel to address evidence processing backlogs in the state police forensic lab system, specifically for DNA testing.

"What is most damaging about the DNA backlog is unsolved crimes, which translates to offenders on the street committing additional crimes," Stevens said.

ISP also is facing increased DNA casework as a result of recent state legislation increasing the number of offenses requiring DNA samples. When it takes effect in a couple of years, a recently passed law (SB 644) will require individuals con-

victed of homicide, attempted homicide, kidnapping, aggravated kidnapping, burglary, and other serious crimes to provide DNA samples to authorities.

Some debate has arisen nationally, however, over DNA testing requirements for arrestees. Upon request by the National Institute of Justice, the National Commission on the Future of DNA Evidence studied privacy, financial, and practical issues involved in gathering DNA samples from arrestees. While the commission is still debating the constitutionality of taking DNA from an arrestee, it urged against such DNA sampling until the convicted offender database backlog is eliminated, more resources are allocated toward DNA testing in cases that do not have a suspect, and additional funding is available for an increased workload.

## Analyzing DNA

The average DNA case takes about a week to complete. First, stain identification is done to identify whether the evidence collected is, in fact, blood, semen, saliva or any other biological matter that could lead to DNA analysis.

“We’ve had car doors come in here where they swear it’s blood and it’s barbecue sauce,” said Cecilia Doyle, DNA group supervisor at the Illinois State Police Forensic Science Center at Chicago.

With the exception of identical twins, each person’s DNA is different. However, a genetic connection can be made between DNA types. In cases where the body of the victim cannot be found, DNA taken from the victim’s relatives may be used and matched to DNA found on a suspect.

Environmental factors can be detrimental to the quality of DNA evidence. DNA can be damaged with exposure to heat, sunlight, moisture, mold, or bacteria.

But advances in DNA technology allow forensic scientists to achieve meaningful results from smaller and more degraded samples. DNA evidence can be retrieved from nearly every surface, including that of soda cans, cigarette butts,

and postage stamps, and forensically valuable DNA can be found on evidence even after several decades.

While DNA testing has done wonders for the field of criminal investigation, it is not without limitations. Like fingerprints, DNA evidence cannot determine when or for how long a suspect was at a crime scene. Investigators look for evidence that can be used to solve a case, such as body

*“What is most damaging about the DNA backlog is unsolved crimes, which translates to offenders on the street committing additional crimes.”*

— ISP Assistant Deputy Director  
Kathleen Stevens.

fluid found where it shouldn’t be. A victim’s blood on the clothing of a suspect, for instance, would be useful evidence.

DNA forensic science training may take up to two years. DNA analysis involves a thorough, three-step process including testing of the evidence and completion of the case file, peer review, and another review by lab supervisors to ensure proper guidelines were followed.

The complex nature of DNA testing allows only about four cases to be completed per month by each scientist. The backlog of DNA cases at the Forensic Science Center hovers near 400. “It’s a tremendous number,” Doyle said.

Stevens said the DNA backlog is a growing problem that also can be attributed to the introduction of new technology. New techniques for DNA analysis must be tested and validated before the technology is available for use by forensic scientists. DNA technology has changed three times since ISP began using it in its forensic labs in the early 1990s.

Each change requires validation and train-

ing prior to actual application of the new technology.

## Prioritizing DNA evidence

Limited personnel resources require an emphasis on effectively prioritizing case processing. Evidence needed for upcoming trials has top priority and lab personnel focus first on completing case files requested by prosecutors.

Suspects can be held in custody for 72 hours if blood or semen is present on evidence. While the testing process typically is long, it is possible for some cases to be handled more quickly, with verbal results given as to the inclusivity or exclusivity of an individual in two to three days.

DNA analysis for investigative purposes in cases where there is a suspect is the next priority.

Last on the list of priorities, but not least important to the criminal justice community, is processing DNA evidence in cases that do not have suspects. The results of these tests are entered into CODIS. The highest backlog is seen in cases where there are no known suspects.

## Reducing the backlog

To reduce the backlog of DNA cases, officials are calling for a state forensic science improvement plan to achieve timely, high quality forensic services. They would also like Congress to appropriate adequate funds for the National Forensic Science Improvement Act, which seeks to improve the quality, timeliness, and credibility of forensic science services for criminal justice purposes.

“DNA is a powerful investigative tool,” Stevens said. “Eliminating the backlog will allow law enforcement officers, prosecutors, and defense attorneys to exonerate the wrongfully accused, solve crimes, and identify possible suspects in crimes where the suspect is unknown.” ■

# New technology, national network, keeps fingerprinting on cutting edge

By Daniel Dighton

In her three years as a latent fingerprint examiner with the Illinois State Police's Forensic Science Center at Chicago, Linda Engstrom has worked some difficult cases. Lately, for the toughest cases, she has used a method for finding fingerprints that involves coating the surface of an object with evaporated gold and zinc particles in a vacuum chamber.

The vacuum metal deposition chamber is generally a method of last resort. It's an attempt to find fingerprints on surfaces where other more conventional methods have failed. Typical objects suitable for the device are plastic bags, glass, and items that have been submerged in water, Engstrom said.

Because it is one of the few machines of its type in the country, the state police

lab has received cases from some distant agencies seeking help with evidence. In a recent case from the New York City Police Department, Engstrom attempted unsuccessfully to develop fingerprints on three plastic bags that had held the remains of a homicide victim.

Engstrom works a lot with the Chicago Police Department's "cold case" unit, which investigates old, unsolved homicides. In one case she handled, a 1979 homicide, she attempted to develop prints on eight plastic bags that had been preserved as evidence and previously checked for fingerprints using a powder technique. Using the vacuum metal deposition chamber she was able to develop three identifiable prints. Unfortunately, it turned out that they belonged to a police officer who worked the crime scene more than 20 years earlier.

Although she hasn't yet linked any developed prints to a suspect, Engstrom isn't discouraged. "It's just a matter of time is what it comes down to," she said, while demonstrating how tiny amounts of evaporated gold and zinc adhere to smooth surfaces such as plastic bags or glass to reveal fingerprints in the machine's chamber.

As its name suggests, the vacuum metal deposition chamber creates a vacuum environment that is significantly below atmospheric pressure. Inside its large cylindrical chamber, a minute amount of gold is heated and evaporated. As the vapors of the metal rise, the metal particles are deposited on the objects inside. Any residue from fingerprints on an object, however, will absorb the gold. Then a small amount of zinc is similarly heated until it evaporates. Those vaporized particles adhere to the gold, except where the gold was absorbed by the oily residue of fingerprints. Any fingerprints on the object are revealed by the absence of the



*Forensic Scientist Linda Engstrom uses the vacuum metal deposition chamber to develop latent prints.*



Photos by Daniel Dighton

grayish-white zinc, which has coated everything else.

The FBI and the U.S. Secret Service use vacuum metal deposition chambers, but before the Chicago lab got one in 1998, ISP had to send items to Ontario, Canada, for that type of testing.

Engstrom, who is one of several forensic scientists trained to use the machine, said she uses it about once a week, but it is generally a method of last resort for developing latent fingerprints on evidence. "I will use it after I've gone through other conventional methods," she said.

## Latent fingerprints

Latent fingerprints are impressions that are left on objects by human fingers, but which are invisible to the naked eye. Because of their unique characteristics, fingerprints have long been a positive means of identification.

Other techniques for visualizing fingerprints on objects include the use of powders, chemicals, dye stains, photographic films and filters, and electronic devices such as lasers and computers. A latent print examiner may use one or several of these techniques to visualize otherwise invisible fingerprints for analysis and make photographic records to preserve the prints.

The use of fluorescent dyes with a laser is one of the most common and successful methods for finding fingerprints at the ISP lab in Chicago, said Jan Girten, chief of the lab's Criminalistics Section.

"The laser really has been a workhorse for us," she said. "We have two of them and they're on day and night."

Another popular method for developing fingerprints is to fume an object by heating superglue in a sealed chamber. The gaseous fumes coat the object with a white material that reveals fingerprints, which can then be photographed or further enhanced.

Latent fingerprints that have been developed on evidence can be used to identify suspects by comparing them to

known fingerprints in a vast database compiled mostly through arrest records.

## State and national databases

The fingerprint database is the backbone of the Automated Fingerprint Identification System (AFIS). In Illinois, the state police's AFIS contains more than 2.5 million scanned fingerprint cards of known individuals, and more than 6,500 unidentified latent prints.

Suspects can be identified if latent prints from a crime scene are entered into the computer and there is a match with one of the 2.5 million sets of known fingerprints in AFIS. The computer system, however, does not do all of the work. AFIS provides a list of possible matches that closely resemble the latent print, and then skilled examiners must visually determine if there is an actual match.

Nationally, the FBI developed and maintains a fingerprint system and database known as the Integrated Automated Fingerprint Identification System (IAFIS), which became fully operational in 1999. IAFIS contains the fingerprints of more than 35 million known individuals.

The ISP's Chicago Forensic Science Center became operational with IAFIS less than a year ago, and as of May was the only ISP lab on the national system. In first nine months that they were using IAFIS, the ISP lab scientists ran 117 cases through the system and got 13 "hits," which means they positively identified a print and possibly a suspect, Girten said.

## Fingerprint cards are critical

The success of any fingerprint system depends on the quality of the known fingerprints on file. Placed on what are known as ten-print cards, these prints are typically taken after an arrest. Three copies of ten-print cards are made: one for local authorities, one for the state police, and one for the FBI.

Each print on a ten-print card must be a good, clear image to be compared to fingerprints from crime scenes. If the prints

on the card are at all smudged, they will be of little use in solving a crime. This situation arose about a year ago when ISP latent print examiners identified a suspect in a Chicago homicide using IAFIS. The same suspect's ten-print card was on file in the state police's system, which was checked first, but the examiners did not get a hit there because the print was smudged, Girten said.

Many agencies now have a system for scanning fingerprints on ten-print cards electronically called Livescan, which allows the fingerprint taker to easily re-roll smudged or partial prints to make sure they are of good quality. But the process still depends on the care and attention of the operator, and does not completely eliminate the chance of poor quality prints getting into the database, Girten said.

Latent print examination accounts for about 11 percent of the cases submitted to ISP labs. During the first six months of 2000, the latest numbers available, state police labs had 390 hits using AFIS, for a success rate of about 35 percent, Girten said.

The rate for hits is not bad, but the time it takes to process those cases is slowed by a shortage of trained forensic scientists. The typical turnaround time for latent print cases at the Chicago lab is about 95 days, although they can do cases in a couple of days if it is urgent, Girten said.

Turnover caused by scientists leaving for better paying jobs in the private sector or for other reasons makes it difficult to keep the labs fully staffed. Girten said she currently has 14 forensic scientists working in latent print, but needs 20 to be fully staffed. She predicts that over the next six to eight years she will need to have 26 forensic scientists to keep up with the workload. ■

# Chemistry lab business reflects police efforts in combating drugs

By Cristin Monti

It is easy to lose sight of the many steps involved in a criminal drug investigation. Every substance collected by police that leads to a controlled substance or marijuana possession charge must be scientifically studied to determine whether the substance is, in fact, illegal.

Following confiscation, substances suspected to be illegal drugs are sent to the Illinois State Police Division of Forensic Services for chemical analysis. A suspect may be prosecuted only after the substance taken from him has been positively identified as controlled or cannabis.

Last year at the Drug Chemistry Section of the Forensic Science Center at Chicago, 47 chemists and three evidence technicians processed 54,000 drug cases. The lab typically completes about 50 percent of its submissions in less than a week.

“Our function is to provide accurate chemical analysis in a timely manner,” said Jim O’Connor, Chemistry Section chief.

Three support staff members coordinate the work to ensure analysis of each piece of evidence is completed in sufficient time.

## Testing strategies

Several items may be tested in a single case. Past cases have included up to 900 pieces of evidence, most commonly plant material, tablets, capsules, powders, drug paraphernalia, and residues. Forensic scientists in the Chemistry Section analyze



Photo by Daniel Dighton

***A chemist at the Forensic Science Center at Chicago conducts a color test for crack cocaine.***

suspected controlled substances using chemical, microscopic, and instrumental techniques. Chemists conduct at least two different tests on each substance during an investigation to determine its exact identity. The type of evidence determines what test will be conducted.

The gas chromatography/mass spectrometry instrument can break down almost every substance to reveal a “finger-

print” of its chemical compounds. Colorimetric tests also are conducted, identifying substances through colors created with chemical reactions. Chemists also use varying techniques with infrared and ultraviolet light to see whether its elements form a controlled substance or cannabis. The manner in which a substance absorbs light is indicative of its chemical structure.

“It’s old-fashioned science,” O’Connor said. “The tests we conduct are definitive. They prove these chemicals *are* heroin. They *are* cocaine.”

## Chemical forensics and funding

Law enforcement activity is the dominating factor in the kind of substances most often sent to the lab for testing. For instance, if a lot of attention is given to combating methamphetamine, police may go after meth labs and chemists will find themselves processing more meth and less of other drugs.

“What we see in our lab depends on what the police bring in here, and what police bring in here depends on the resources put into drug operations on the streets,” O’Connor said. “The drugs we analyze may not be representative of what’s out there — it’s a representation, but not always an accurate representation.”

O’Connor said overall the amount of funding received for chemical investigation has kept up with increasing numbers of cases.

## Trends in drug use

In each case, chemists determine whether the substances they are testing include those listed as illegal under the Controlled Substances Act, usually under schedules I-IV.

Drugs in Schedule I of the Controlled Substances Act are substances that have a high potential for abuse, no currently acceptable medical use in treatment, and lack any accepted safe use under medical supervision. Schedule II drugs include substances with a high potential for abuse with severe liability to cause psychic or physical dependence, but have some approved medical use. Schedule I and II drugs include, but are not limited to, cocaine, heroin, methamphetamines, and hallucinogenics.

*“There are a million different things you can do with chemicals. There are constantly people out there making new drugs and figuring out ways to beat the system with the chemicals they use.”*

— Chemistry Section Chief Jim O’Connor

Drugs in schedules III and IV have safe and accepted medical uses in the U.S. They include substances containing smaller amounts of certain narcotic and non-narcotic drugs, anti-anxiety drugs, tranquilizers, and sedatives. Schedule III drugs have a lower potential for abuse than those in schedules I and II, and include mixtures of limited specified quantities of codeine, morphine, or opium, with other non-controlled active ingredi-

ents. Valium and appetite suppressant drugs fall under the Schedule IV category.

In 2000, more than 220,000 pieces of evidence were tested in the Drug Chemistry Section of the Chicago Forensic Science Center,

a 5 percent increase from 1999. Of the items submitted for analysis in 2000, 70,090 contained cannabis and 149,051 revealed a controlled substance (Figure 1).

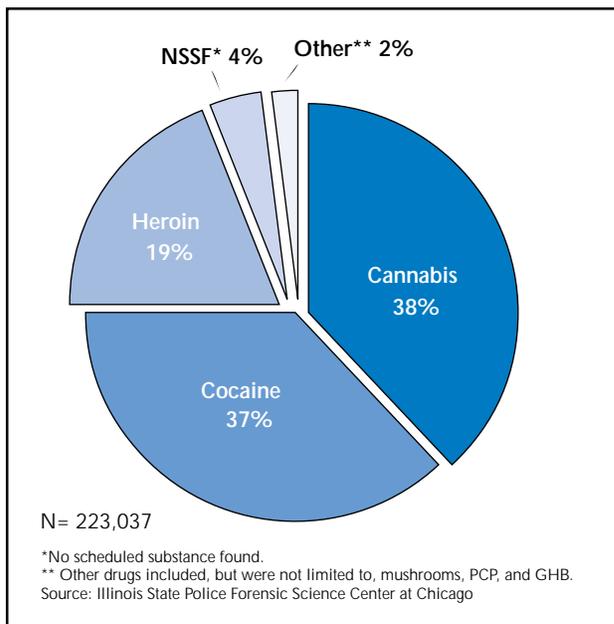
Cocaine, cannabis, and heroin are the most commonly analyzed substances in forensics labs across Illinois, but tests are revealing a steady increase in designer drugs such as GHB (gamma hydroxybutyrate), also known as the date rape drug, and MDMA (methylenedioxyamphetamine), or Ecstasy.

O’Connor said the lab has been processing an increasing amount of ketamine, also known as Special K. Ketamine is an anesthetic used in the veterinary field and is listed as a Schedule III substance.

“There are a million different things you can do with chemicals,” he said. “There are constantly people out there making new drugs and figuring out ways to beat the system with the chemicals they use.” ■

Figure 1

Percent of drug cases at the Forensic Science Center at Chicago reporting illegal substances in 2000



# Program improves evidence collection and response to sexual assault victims

By Jennifer Hiselman

In 1999, more than 6,000 criminal sexual assaults were reported to police in Illinois. Although this number has declined over the past few years, we know that this is only a small portion of the true number of sex crimes committed statewide. National victimization estimates indicate that only about one in four sexual assault victims ever report these incidents to police.<sup>1</sup> Other estimates are even lower. The National Women's Study estimated only 16 percent of rapes against women 18 or older are reported to police.<sup>2</sup> Thus, many of these victims face the traumatic aftereffects of victimization without much, if any, assistance, and aware that their assailant is at liberty to victimize others.

Many rape victims often decide not to report because they fear others will not believe them. This fear is not unwarranted, as sex crimes can be very difficult to prosecute. The crucial element needed to convict a sex offender is forensic evidence. Because sex crimes typically occur without the presence of witnesses or much visible physical injury, forensic evidence may be the only indication that a crime occurred. Forensic evidence can also provide the extra confidence the victim needs to move forth with prosecution.

Illinois' newly implemented Sexual Assault Nurse Examiner (SANE) programs attempt to alleviate barriers to prosecution in three ways. First, victims can receive immediate, compassionate, and comprehensive medical-forensic

evaluation and care by a professional nurse examiner who has the training and experience to anticipate their needs during this time of crisis. Second, sexual assault nurse examiners provide complete information about choices so that victims can make informed decisions about reporting the crime to police, the care they receive in the emergency department, and the assistance that is available to them. Finally, the program trains sexual assault nurse examiners to collect and present forensic evidence more efficiently to increase the success rate of sex crime prosecutions in Illinois. This can accelerate the victim's recovery, prevent secondary injury or illness, and ultimately increase the prosecution of sex offenders.

The Authority was charged with piloting four SANE programs with state general revenue funds. Federal Victims of Crime Act (VOCA) funds were designated for purchasing forensic evidence tools — colposcopes — for each of the hospitals implementing SANE programs. Programs were implemented in Lake, DuPage, and Champaign counties in 2000. Another program will be established in Cook County this year.

## Need for programs

The need for SANE programs became apparent after medical professionals throughout the country recognized that services to sexual assault victims admitted to emergency departments often were not adequate. Victims would frequently have to wait several hours in busy, public areas while not being allowed to eat, drink, or use the restroom for fear of destroying evidence. Moreover, medical staff often were

not specifically trained to conduct forensic examinations on sexual assault victims, much less how to meet the emotional needs of victims after such a dehumanizing form of violence. Finally, medical staff often lacked the ability to provide expert witness testimony, which is critical to prosecuting sexual assault cases. As research became more prevalent on the complex needs of sexual assault victims and the importance of efficient collection and presentation of evidence in prosecution, medical professionals recognized the need for an improved response to sexual assault victims.

## Compassionate care for victims

Sharon Dimitrijevic is a registered nurse and sexual assault nurse examiner at Midwestern Regional Medical Center in Lake County. She explained that when a victim of sexual assault is admitted to the hospital's emergency department for treatment, emergency room workers immediately page a sexual assault nurse examiner. There is a nurse examiner on call 24 hours a day, seven days a week. An emergency room staff member also will page a rape crisis advocate from the Lake County Council Against Sexual Assault (LaCASA), the local sexual assault program, so the victim can be offered on-site advocacy services. The victim is taken to a private room until the sexual assault nurse examiner arrives.

The sexual assault nurse examiner explains the forensic evidence procedure to the victim, provides information on how the evidence will assist with prosecution if the victim decides to press charges, and also offers the services from LaCASA.

---

*Jennifer Hiselman is a research analyst with the Authority's Research and Analysis unit.*

The nurse examiner informs the victim that the LaCASA rape crisis advocate is available on-site to provide support and information before, during, or after the forensic examination. Most sexual assault victims treated at Midwestern Regional choose to receive the advocate's services during their stay, Dimitrijevic said.

## Evidence collection

According to a guide from the U.S. Department of Justice, Office for Victims of Crime, the four primary uses of the evidence collected by sexual assault nurse examiners are: to confirm recent sexual contact; to identify the perpetrator; to verify the victim's account of the incident; and to demonstrate the act was not consensual, but was forced or coerced.<sup>3</sup>

Nearly all hospital emergency departments use the traditional sexual assault evidence collection kits. Although the evidence collected using the kits can be used for all four purposes mentioned above, such evidence is most likely only going to help confirm sexual contact and identify the perpetrator. It is much more difficult to obtain evidence corroborating the victim's story and demonstrating that sexual contact was forced or coerced. Clothing can be used to help corroborate the victim's story if stains or debris collected are consistent with the surroundings as described by the victim. Evidence to support that the sexual contact was not consensual is most likely derived from physical injuries; however, most sexual assaults do not involve visible physical injuries.<sup>4</sup>

Another method of identifying coerced or forced sex used at Midwestern Regional Medical Center involves the use of a staining agent known as Toluidine blue. Toluidine blue can substantially enhance the visualization of genital injuries by staining perineal and perianal lacerations and abrasions on victims. The dye only stains if such injuries are present, thus increasing its capacity to detect trauma that is not visible with the naked eye, Dimitrijevic said.

## The colposcope

All Illinois SANE programs funded by the state include the colposcopic examination as part of their evidentiary exam protocol. The colposcope is the latest technological advancement in the detection of trauma in sexual assault victims. Evidence collected using a colposcope can help substantially in identifying victims of forced or coerced sexual contact.

### *The colposcope is the latest technological advancement in the detection of trauma in sexual assault victims.*

The colposcope has been extremely valuable at Midwestern Regional for increasing the ability to detect trauma in sexual assault victims, Dimitrijevic said. It is used on all victims treated through Midwestern Regional's SANE program. The colposcope is an instrument with a magnifying lens using a binocular system that can enhance visualization of up to 80 percent of injuries resulting from sexual assault. It magnifies injuries up to 30 times greater than what can be seen with the naked eye. The colposcope also serves as an excellent light source. Without the aid of the colposcope, 80 percent of injuries on victims could be potentially missed, Dimitrijevic said.

The colposcope is non-intrusive, making it an especially effective tool to use with child victims. In fact, the scope never touches the victim. The colposcope is positioned about a foot away from the area on the victim to be examined and photographed. The colposcope is attached to a computer monitor, on which the picture is magnified for the nurse examiner to evaluate. The colposcope can detect microscopic trauma such as tears, abrasions, swelling, or bruises. The colposcope can also help identify victims of repeated inci-

dents of sexual abuse by detecting microscopic scar tissue.

The benefits of the colposcope rapidly decrease as time elapses between the assault and the time that the victim is examined. In fact, nearly half of visible injuries may become healed after only 72 hours, so it is important that the colposcope be used as soon as possible after the assault, Dimitrijevic said.

Although some injury may be detected with consensual sex, the degree of trauma and the number of areas that show injury are much less than what typically appears after forced sex. Although no colposcopic exam can ultimately confirm whether or not sex was consensual, an exam showing multiple abrasions and tears will certainly add convincing evidence to help increase prosecution rates, Dimitrijevic said.

## Evaluation of programs

As part of the legislation funding the four SANE pilot programs, the Authority is evaluating the programs and must present a report to the General Assembly within two years of implementation. To complete this report, Authority staff will gather information from sexual assault nurse examiners, rape crisis advocates, and prosecutors who have worked with sexual assault victims treated through the programs. ■

## Notes:

1. Bureau of Justice Statistics' National Crime Victimization Survey. *Criminal Victimization 1999, Changes 1998-1999 with Trends 1993-1999*. August, 2000.
2. Kilpatrick, D.G., Edmunds, C.N. and Seymour, A.K. Rape in America: A report to the nation. National Victim Center: 1992.
3. U.S. Dept. of Justice, Office for Victims of Crime 1999. *Sexual Assault Nurse Examiner (SANE) Development and Operation Guide*. Sexual Assault Resource Service. Minneapolis, Minnesota.
4. Ibid.

# National ballistics system links weapons to bullets and cartridges from crime scenes

By Jennifer Fortney

When Benjamin Smith went on a shooting spree randomly targeting minorities over Independence Day weekend in 1999, the bullets he left behind provided valuable clues for investigators. While Smith was on his deadly trek from Chicago to Bloomington, Ind., police and laboratory analysts were working overtime to find answers.

The rampage that began in Chicago on Friday would take two more days and stretch across hundreds of miles before coming to an end. Two innocent victims lay dead and nine were wounded before Smith finally took his own life. He left behind 13 crime scenes involving seven police jurisdictions in two states.

Each time Smith sped away from a crime scene, police scoured the area for fired bullets and discharged cartridge cases. These would be collected and analyzed at the Illinois State Police Forensic Science Center at Chicago. Among the questions the analysts would be attempting to answer: What weapons were used? Was more than one shooter involved? Had the weapons been used in other crimes?

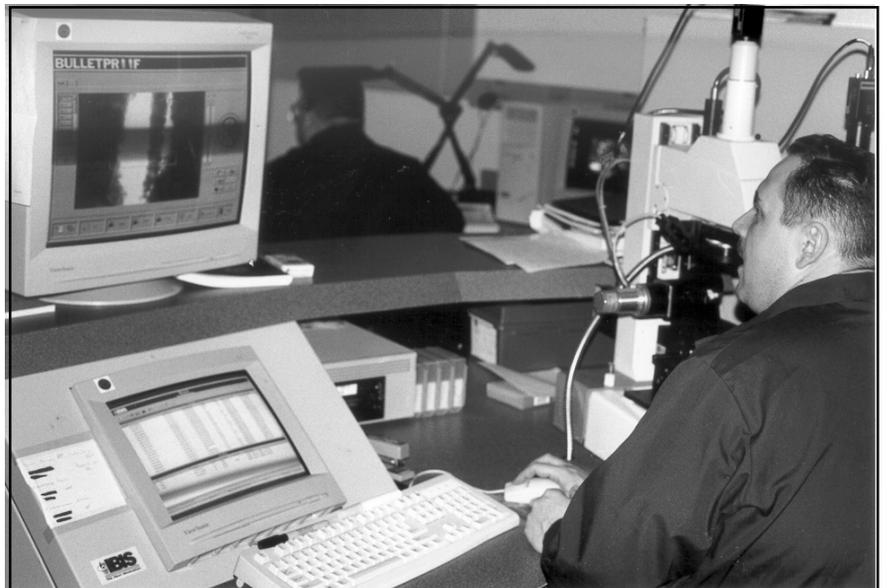
Highly trained forensic scientists and technicians would attempt to answer these questions with the aid of sophisticated computers networked with the Integrated Ballistics Identification System (IBIS). Using high-powered microscopes and a digital imaging system, IBIS enables analysts to compare fired bullets and

discharged cartridge cases to determine where they originated. IBIS's computerized database helps analysts link firearms evidence to other cases, and to link suspects to crimes.

## Unique prints from each gun

Each gun has unique markings, similar to fingerprints, which it leaves on fired bullets and discharged cartridge cases, said Joseph Thibault, firearms supervisor at the ISP's Forensic Science Center at Chicago.

With IBIS, bullets are examined under a microscope, which shows the unique striations or markings created by the bore when the bullet is fired. When a gun is made, the gun manufacturer bores a hole



Photos by Daniel Dighton

***IBIS Technician Chris Holy mounts a bullet to be analyzed under a microscope (above), and then uses the IBIS computer and monitor to inspect the bullet's unique striations.***

Jennifer Fortney was an intern with the Authority's Office of Public Information.

in the barrel stock using a drill, which leaves unique marks. Metal against metal will leave a different impression even when the same drill is used to make the hole. The gun's firing pin and breech face leave unique impressions on the discharged cartridge cases.

When ballistic evidence is brought into an ISP lab, it is documented and manually compared to other similar fired bullets, or discharged cartridge cases found at the scene. Then the discharged cartridge case or fired bullet is set under a microscope and digital camera attached to a computer and monitor. As the evidence is scanned, images of unique microscopic markings are photographed and entered into a database. Those images can then be compared to others on the IBIS network.

As technicians analyze fired bullets or discharged cartridge cases, IBIS will automatically search for "hits" and provide a long list of possible matches. The first five or 10 matches listed are most often the ones investigators compare. "It's taking just a few minutes to do what used to take two or three weeks," said Brian Mayland, a forensic scientist at the ISP lab in Chicago.

When the system identifies a possible match, two firearms examiners must con-

## *As technicians analyze fired bullets or discharged cartridge cases, IBIS will automatically search for "hits" and provide a long list of possible matches.*

firm that it is accurate. "No ID's are made [entirely] off the system," Thibault said.

After Smith shot former Northwestern University basketball coach Ricky Byrdsong in Skokie, investigators found seven bullets at the scene, including one that passed through the window of a nearby home. A short time later, police were gathering evidence from a similar shooting scene in Northbrook, another Chicago suburb.

By noon on Saturday, Mayland had been called into ISP's Chicago lab to help with the investigation. Dozens of bullets and cartridge cases recovered during this shooting spree had been taken to the lab for analysis.

"This particular case was a little different from my perspective," Mayland said. In most cases, he examines the remnants of crime after it has been committed, and then proves or disproves investigators' assumptions about what

happened, he said. In this case, evidence was coming in while Smith was on his shooting spree, and investigators knew they had to move fast.

Mayland quickly determined that there were only two guns involved, a .22-caliber and a .380-caliber. This information, combined with witness statements, helped police determine that only one person was responsible for the spree. Less than 24 hours after the first incident, police knew there was one shooter, and, with other information gathered during the investigation, they had identified a suspect.

The shooting spree finally came to an end when Smith shot and killed himself in Salem, Illinois. But there were still many unanswered questions. Mayland continued to look at all of the evidence to ensure there was not a copycat shooter. He also checked IBIS to see if Smith's guns had left prints at other crime scenes. It turned out that the guns Smith used were not linked to any crimes other than the holiday weekend rampage.

Forensic Technology, Inc., in Montreal, Canada, developed IBIS, which is supported in the United States by the Bureau of Alcohol, Tobacco and Firearms. IBIS is becoming the standard ballistics system in labs across the country. In Illinois, the state police labs at Chicago, Joliet, and Rockford are on the same IBIS network. The DuPage County Sheriff's Office forensics laboratory and the Northern Illinois Police Crime Lab also are on the IBIS network. ISP labs in Morton, Springfield, Fairview Heights, and Carbondale use a similar system, Drugfire, which was developed by the FBI, but they will soon be converting to IBIS, said ISP Deputy Director Teresa Kettelkamp. ■



Photo by Daniel Dighton

***Forensic Scientist Richard Amberger analyzes a handgun at the Forensic Science Center at Chicago. He was attempting to recover the gun's serial number, which had been ground off.***

# Every crime scene is different for the investigators gathering the evidence

By Jennifer Fortney

In September 1993, a badly beaten female body was discovered on Chicago's South Side. Crime scene investigators collected evidence and took photos of the body, which had been dragged through an abandoned lot and left on a burlap bag. There was a great deal of physical evidence to collect, but no obvious link to a suspect, and the case went unsolved for years.

## DNA helping with old cases

Six years later, an officer with a special "cold case" unit of the Chicago Police Department that investigates old, hard-to-solve cases, was looking at the photos of the scene while working on the unsolved murders of several drug-using prostitutes in the same area. The burlap bag caught her attention. After finding it in an evidence storage room, she had it sent to the Illinois State Police Forensic Science Center at Chicago for analysis. Forensic scientists at the lab discovered a semen stain on the bag. Through DNA analysis, this piece of evidence ultimately helped police solve the string of murder cases.

"When you do get one (a killer), it's gratifying," said Sgt. Jack Ridges, program director for the CPD's Central Homicide Evaluation and Support Squad (CHESS).

The job of gathering the information is a difficult experience, emotionally and physically, Ridges said. In addition, a lot of good information does not necessarily mean that the bad guy gets caught. But

something like a burlap bag can make an incredible difference.

"DNA is now doing a lot of linkage for us," Ridges said, referring to the application of DNA analysis to evidence from cases that may be several years old.

## Paint chips help solve a case

But other, more rudimentary methods of gathering evidence are just as important.

In the early morning of Feb. 25, Karen Bockhol and her

After a failed four-day air search, Joliet police organized a wide-scale foot search. "Our guys physically started walking the shore line," said Cmdr. James Grace of the Joliet Police Department. The ground troops found a scene and were able to start collecting clues. They discovered fresh damage to a tree and traces of paint. These were strong indicators that there had been an accident and the van may be in the cold river, Grace said.

On March 1, fire department divers began a search in the murky Des Plaines River. The van was found upside down at the river bottom and the bodies of the missing Bockhol family members were inside the vehicle.

In the end, it was determined through further examination and analysis that foul play was not involved. Due to faulty brakes, the van collided with the tree and slid into the water. "Forensic evidence in this case saved us one day's time in the search process," Grace said.

"There is no good rule for evidence," said Chicago Police Department Lt. John Huels, who has been a crime scene investigator since 1983. He said that when he enters a scene he never knows what he'll come across. Sometimes something as simple as a paint chip will solve the case.

Forensic investigators usually arrive on the scene behind a string of others, such as patrol officers, supervisors, and detectives. In Chicago, about 160 police officers collect evidence over three shifts



two adult children pulled away from their home in a white minivan to deliver Sunday newspapers in Joliet. Concern grew, however, when the family did not return from their route as expected. Police began an air search covering a 10-square-mile area near the Des Plaines River, where they had last been seen.

throughout the city. A majority of these officers are evidence technicians who generally handle property crimes, Huels said. Forensic investigators, who handle major violent crimes, are paired off, and two sets are on duty at most times to cover the entire city.

When investigators arrive at a homicide scene for instance, typically one takes photographs while the other talks to witnesses and police officers who arrived on the scene earlier. It is necessary to get as much information as possible. For example, if the investigator knows the victim and relatives don't smoke and then sees a cigarette butt on the floor, that butt could be valuable evidence. Similarly, if the patrol officer who arrived first said the victim has been moved, investigators can get a better picture of what to collect, or where valuable evidence may be hidden.

### Body fluid key evidence

Body fluids that can be DNA tested are often the best pieces of evidence, along with ballistic evidence, which can be tracked in the lab, Huels said. Chemicals, clothing fibers, and blood spatter analysis also may play an important role in solving the crime, according to Huels. Dusting for fingerprints is still a large part of the job, too.

Finally crime scene investigators pack evidence in paper or a tube and ship it to the Illinois State Police for analysis. In some instances the courts will call on them later to testify. The process must be systematic and accurate because evidence collected today may have long-term effects.

The value of thorough evidence collection and improved DNA testing was evident in another old case that Ridges and the CHES officers were able to solve.

In 1987 a young woman had been stabbed 30 times in her home. Her door was made of metal, and almost impenetrable. There was no forensic evidence

indicating forced entry, so police suspected that she knew her attacker, but the case remained unsolved.

Ridges and his team found old swabs collected at the scene, which had been stored in a refrigerator. The DNA was useful, but could not be matched in the Combined DNA Index System, the FBI's national DNA database used to generate suspects in unsolved cases and identify se-



rial cases. Time passed and they finally got a tip on a man who had died several years before. Ridges did a DNA test on one of the suspect's family members and found a match.

"The hardest part of this case was to go back to the girl's mother and tell her that her best friend's son did it," Ridges said. "It really leaves an impression on you, a case like that."

Because of cases like this, members of law enforcement are encouraged to

keep more evidence longer in anticipation of further advances in technology, he added.

While DNA testing and databases are major developments for police, Hayden Baldwin, a retired Illinois State Police crime scene investigator, said other techniques remain important.

He remembered one case in which a family came home from shopping to find that their house was ransacked, and several pieces of jewelry and their VCR were missing.

Within moments after arriving on the scene Baldwin found the point of entry, where markings from a pry bar were left on the metal door jam of the sliding glass patio door. Two different footwear patterns were found on the kitchen floor. From examining the objects the suspects had touched while ransacking the three bedrooms, closets and the family room, it was discovered that they were wearing gloves with an odd pattern on them. Officers canvassing the area spotted two men walking near the scene and stopped them for questioning.

"The officers then noticed a pair of gloves sticking out from one of the males right rear pocket," Baldwin said. The gloves were taken to the scene and matched the pattern discovered by investigators. Their shoes also matched the prints near the door. "The suspects were told of the evidence and they confessed to the crime," he said. "All stolen property was recovered." ■

# Survey shows rise in computer crime

By Steve Prisoc

Associate Director, Information Systems Unit

The Computer Security Institute's (CSI) annual Computer Crime and Security Survey was released in March. One of the most important measures of computer crime in the U.S., the survey is produced in collaboration with the FBI's Computer Intrusion Squad in San Francisco.

## Large scale cybercrime

The survey covered 2000 and was taken in December of that year. Based on responses from 538 computer security practitioners employed by corporations, government agencies, financial institutions, medical institutions, and universities, the survey indicated that cybercrime increased substantially last year.

The survey showed 85 percent of respondents detected computer security breaches within the last 12 months. Nearly 65 percent of those surveyed claimed financial loss as a result of a security breach, and they said that most losses were due to theft of proprietary information or outright fraud.

Most respondents said the most common point of breach was through their Internet connection. However, the number of reported security breaches through internal systems dropped nearly 50 percent since last year, with 30 percent of respondents indicating instances of internal computer crime.

Reporting cybercrime to law enforcement is on the rise, according to the survey. About 35 percent of respondents reported security breaches to law enforcement in 2000, while 25 percent acknowledged reporting such crime the previous year, and only 16 percent of cybercrime victims reported contacting police the year before that.

Abuse of employee Internet privileges and denial of service attacks are increasing. Thirty-eight percent of respondents indicated they had been victimized by a denial of service attack, which can disable a Web site by flooding it with requests for service, subsequently blocking access by legitimate users. Denial of service attacks have been widely reported by the press and in the last year a number of prominent companies, including Yahoo and Amazon, suffered severe losses as a result. About 25 percent of respondents reported denial of service attacks last year.

Companies reported a significant increase in abuse of Internet privileges by employees, with 91 percent indicating abuses such as downloading pornography or pirated software, or inappropriate use of company e-mail. This is up from 79 percent last year. This could be attributed to the increasing tendency of organizations to monitor Internet use and the proliferation of software designed to detect such abuse. Re-

ports of computer viruses also rose, with 94 percent of respondents indicating that viruses were detected in their systems. The year before, 85 percent of respondents detected viruses.

Particularly disturbing was CSI's finding that 13 percent of respondents admitted to being victimized by theft of transaction information. Such information on transactions, particularly those related to Internet purchases, including customer names, passwords, credit card numbers and other personal information, could be used to directly defraud consumers. Sometimes the information is used to obtain credit cards in the victim's name. This constitutes identity theft, and according to the Privacy Rights Clearinghouse, 500,000 to 700,000 Americans were victims of identity theft last year.

## Personal cybercrime

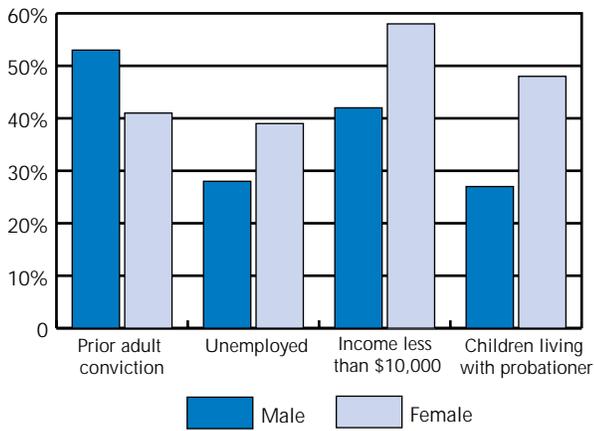
Cybercrime against individuals has become increasingly common in recent years as more commerce is conducted over the Internet. According to the Internet Fraud Complaint Center (IFCC), a joint effort of the National White Collar Crime Center and the FBI, Internet auction fraud is by far the most reported fraud, accounting for almost two-thirds of all complaints to IFCC. Non-deliverable merchandise or non-payment accounted for an additional 22 percent of complaints. Credit and debit card fraud made up almost 5 percent of complaints. Other types of confidence fraud, such as home improvement scams and investment fraud, also figured among the most reported offenses.

Between May 8 and Nov. 8, 2000, the average dollar loss for an Internet fraud against all victims, businesses, and individuals was \$894. The average loss for individuals alone was \$255, but more than 17 percent of victims suffered losses greater than \$1,000. Almost one-third of victims endured losses of less than \$100, and two-thirds lost under \$500. The greatest losses were suffered by victims of Internet investment fraud since larger amounts of cash are usually required up front. The lowest dollar loss amounts were associated with auction fraud offenses.

Illinois ranked fifth among states for the number of individual victims who filed complaints with the IFCC and ranked seventh for the number of individual perpetrators. The report shows that 3.5 percent of perpetrators reside in Illinois, but 4.3 percent of individual complainants live in Illinois. California seems to be the clear leader in Internet fraud with 17 percent of individual perpetrators and 15 percent of individual complainants. ■

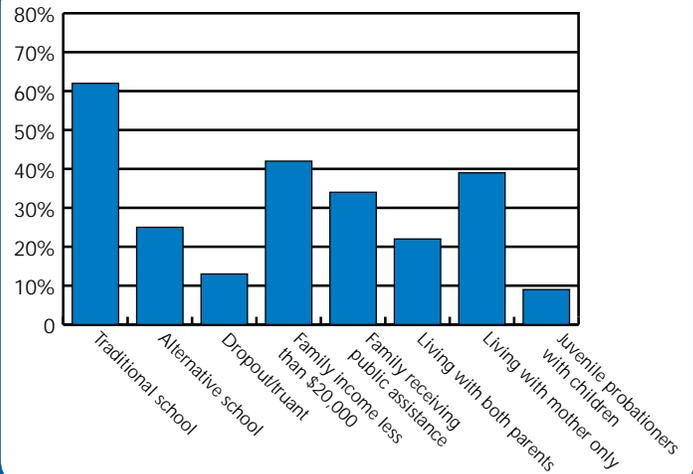
# Illinois Probation Outcome Study\*

Comparison of adult male and female probationers



The 2000 Illinois Probation Outcome Study found that female probationers had less extensive criminal histories than males, but females had higher levels of unemployment at case entry, and as a result, a larger percentage of female probationers had annual incomes of \$10,000 or less. In addition, female probationers were much more likely to have children living with them, and 15 percent of adult female probationers were pregnant at some point during their supervision periods.

Education and family factors for juvenile probationers



The study also found that the majority of juvenile probationers were enrolled in traditional school programs, and a large proportion of juveniles were from families with annual incomes below \$20,000 and were receiving public assistance. The majority of juvenile probationers were not living with both parents at the time of case initiation, and juvenile probationers were most frequently residing with their mothers alone. Nearly 10 percent of juvenile probationers (male or female) had children of their own, and 15 percent of female juvenile probationers were pregnant during their periods of probation supervision.

\*Source: Preliminary analyses from the 2000 Illinois Probation Outcome Study. The Authority will publish a full report based on the study this year. For further information contact research analysts David Olson or Sharyn Adams at the Authority.

**ILLINOIS**  
Criminal Justice Information Authority

120 S. Riverside Plaza, Suite 1016  
Chicago, Illinois 60606  
312-793-8550, TDD: 312-793-4170, Fax: 312-793-8422  
[www.icjia.state.il.us](http://www.icjia.state.il.us)

PRESORTED STANDARD RATE  
U.S. POSTAGE  
**PAID**  
CHICAGO, IL  
PERMIT NUMBER 4273

For address corrections, additions, or deletions, write the information below and return this portion of the page to the Authority's Office of Public Information. Please include your telephone number. Thank you.

---



---



---