

Following a Trail of Blood

THE CASE

It was the same M.O. (modus operandi): a series of robberies in Ottawa starting late in the autumn of 2000. At three of the crime scenes, the perpetrator left blood, probably from a cut as he smashed his way in.

CASE STUDY 2

THE POLICE

As soon as biological evidence is detected at a crime scene in Ottawa, the uniformed officers call in the forensic identification officers. They are trained to secure evidence that might carry DNA, preserving it “untainted” for analysis by specialized forensic laboratories.

“DNA evidence is becoming more important than fingerprints for crime detection,” says Sgt. Don Sweet, the DNA Data Bank Coordinator with the Forensic Identification Section of the Ottawa Police Service. “We’re seeing its impact practically every day.”

THE NATIONAL DNA DATA BANK

The Ottawa Police Service regularly forwards DNA evidence via the Biology Sections of Canada’s Forensic Laboratories to the Crime Scene Index of the National DNA Data Bank. The Index only receives DNA profiles from crime scene investigations of criminal offences designated in the DNA Identification Act. That includes serious crimes like murder and sexual assault as well as secondary crimes like break and enter.

At the Data Bank, DNA profiles are immediately cross-referenced with other crime scene evidence as well as with the parallel Convicted Offender Index. In the unsolved Ottawa case, the high-tech comparison of the three bloodstained break-ins showed a definite DNA link between the incidents.

“That was really important information,” recalls Sgt. Sweet. “We knew we had a serial break and enter guy.”

THE INNOVATIONS

Shortly after, Sgt. Sweet was called to take a DNA sample from a man who was convicted in the spring of 2001 for a separate break and enter. Consistent with the DNA Data Bank legislation, the judge in the case had issued an order for the sample to be taken and forwarded to the Data Bank’s Convicted Offender Index.

“It’s become a routine part of what I do,” explains Sgt. Sweet. “We use the sample kits that the Data Bank provides us. They’re simple and effective. We usually take blood. It gives the most dependable results.”

The DNA sampling kits are a good example of the innovative approach to DNA collection, analysis and storage that characterizes Canada’s National DNA Data Bank. “The kits are very well accepted by police officers as they are simple to use and help make their jobs easier in the long run,” says Frances Porelle, DNA Training and Collections Manager at the Data Bank.

Facilities in other countries require enormous cold storage containers to maintain the quality of the DNA samples that are awaiting processing or being kept for future reference. The Canadian system uses specialized blotting paper that stabilizes the DNA and allows it to be stored at room temperature in secure cabinets.

“The specialized paper, known as FTA, is at the heart of our automated processing and analysis system,” explains Dr. Chantal Fréreau-Aubin, Research Scientist at the National DNA Data Bank. “We tested a prototype collection kit and the paper’s effectiveness when we used DNA analysis to help identify the 229 victims of the Swissair Flight 111 aircraft disaster off Peggy’s Cove, Nova Scotia in 1998. It works extremely well in the

field, it’s very cost effective, and speeds up our processing time dramatically.”

The Data Bank relies heavily on robotic technology. The robotic workstations, along with a state-of-the-art inventory and sample tracking system known by the acronym STaCSTM (Sample Tracking and Control System), allows Data Bank staff to process many samples in a shorter time frame and at significantly lower cost compared to other facilities around the world. STaCSTM acts as an interface between machines and DNA analysts to form a seamless system. It provides unparalleled processing quality and sampling integrity that enables both the privacy and security of each DNA profile and sample.

“We are very pleased with the approach,” says Kathy Bowen, Manager of DNA Analysis at the National DNA Data Bank. “This appears to be one good example of how highly trained individuals can get the most out of automation and technology.”

THE MATCH

“In July of 2001,” says Sgt. Sweet, reading from his extensive notes on the case, “we got word from the regional forensic laboratory that the DNA profile developed from the break and enters were from the same person, however the identity was still unknown. We then received word that the National DNA Data Bank had a hit with a convicted offender profile. They matched the sample of the offender with those three break and enters where we had found blood.”

THE RESULTS

That information would eventually crack all three cases, but the police work was far from over. A DNA profile match by the National DNA Data Bank leads to a thorough process that is designed to both confirm evidence and to protect the rights of the suspect. The work on the original crime scene evidence must be reviewed and a warrant for a known sample from the suspect must be obtained. It is the DNA profile developed from the warrant sample that establishes the link between the suspect and crime scene and provides critical evidence at trial.

“DNA evidence is powerful. Using this advanced science, and teaming the scientists with the investigators, we can turn cold cases into convictions,”

says Sgt. Sweet. “We’re very careful with quality control of our evidence gathering and our handling of biological materials. And it’s having an effect. Judges are much less hesitant about issuing orders for DNA sampling. I think they see that we’re using the technology responsibly.”

The Officer-in-Charge of the Data Bank agrees.

THE NEED FOR MORE SAMPLES

“We know from court statistics that we should be processing about 30,000 offenders’ samples per year in Canada. We’re equipped to handle that many and more,” says Dr. Ron Fournery. “But each sampling requires a judge’s order. This was expected to be automatic in convictions for the



more serious offences – the primary designated crimes, as they are called [see Appendix A] – but this currently is not happening. One of our immediate priorities is to raise awareness about the specific requirements of the Act and how the Data Bank plays a key role in the criminal justice system.”

“There are real opportunities for us to licence these applications around the world,” observes Dr. Fournery. “With this technology, we also export our way of doing criminal investigations. Canadian values of respect for privacy, rigorous quality control of evidence, and advanced data security are built into these systems. That might end up being the most significant contribution we make to crime detection in other countries.”