



Fingerprints are Forever

Teasing out the tell-tale touch

It is the oldest and most widely used tool of forensic science, but fingerprint technology continues to transcend its roots. When this identification technique first began to prove its worth to police more than a century ago, the presence of a fingerprint had to be fairly obvious and it was difficult to match with anyone other than a suspect already in custody.

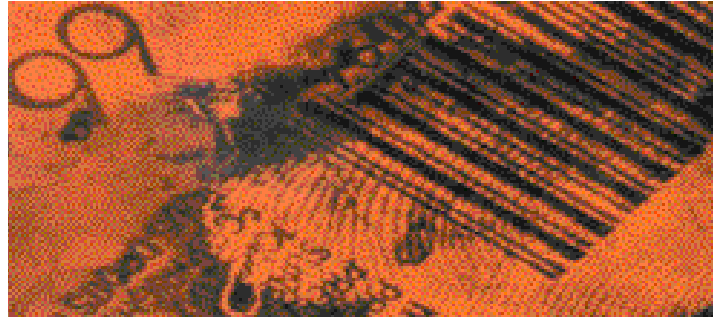
Today's **AFIS** (Automatic Fingerprint Identification System) quickly compares scenes-of-crime fingerprints with millions of fingerprints stored in a computer database. At the same time, fingerprints are now readily obtained from what once seemed like impossible sites, including human skin or the inside of plastic bags that have been used to store body parts for years.

The ability to find fingerprints on such unlikely surfaces owes much to ongoing research conducted through the Canadian Police Research Centre. Dr. John Watkin, a biochemist who joined this unit of the National Research Council in 1974, is among the pioneering figures in this field.

"The NRC has all kinds of workshops and facilities that the police don't have", he observes. "By staying in touch with both the technical possibilities of science and the technical problems encountered by the police", he adds, "CPRC researchers like me can open up new horizons for forensic work."

His own research began after researchers in Toronto discovered that the light emitted by laser beams could cause fingerprints to fluoresce. The practical applications were limited, since lasers were far from being portable enough to carry to crime scenes. But Dr. Watkin found that other intense forms of light could achieve the same effect, and he designed a fingerprint lamp for just that purpose.

A Canadian company manufactured a pre-production prototype of this invention, the Lumalite, which has become familiar to any investigator looking for fingerprints. The light also identifies scene-of-the-crime trace fibres such as hair or other man-made fibres, which are often crucial to case-solving evidence.



"One of the key focuses of the Canadian Police Research Centre is involvement with the police community. It has been the dynamic interaction between these organizations that has fostered such significant progress. Things that we were doing were not just theoretical, they would be applied in real crime scenes. The CPRC is truly making a difference." — Dr. Della Wilkinson

Even as his work on the Lumalite was proceeding, Dr. Watkin was studying the implications of another discovery. A police officer in North Bay Ontario found that when an object was placed in a vacuum with a small amount of methyl cyanoacrylate — popularly known as Crazy Glue — this material settled as a white residue onto fingerprints that might be on the object. He built the vacuum fingerprint chamber prototypes of equipment that can now be found in police laboratories around the world, revealing fingerprints in a matter of minutes.

In 1990, he began working with chemist Dr. Della Wilkinson on methods for enhancing this process. Working with the compound Thenoyl Europium Chelate, or TEC, they found ways of making visible fingerprints glow where none were visible before application of the dye. Dr. Wilkinson, who has since become a research scientist with the RCMP, says this is typical of the innovative activity that has kept Canada at the forefront of a forensic community spanning the globe.