The Science and Skills of Forensics

The Theory of Transfer states that when two surfaces come into contact, a transfer of material or an impression from one to the other usually takes place. The basic job of a forensic investigator is to identify the evidence that is left behind by this transfer, to collect this evidence, to preserve it, and after analysis, present the results in court. This requires extensive training in many of the forensic sciences.

Anthropology

Working with human remains is never pleasant but is a necessary skill that Forensic Identification Unit members are trained in. Careful collection of evidence at the discovery site can reveal a wealth of information. The skills of a wide number of scientists are drawn upon in order to interpret what is found; forensic pathologists, forensic odontologists, entomologists and anthropologists are just a few of those who may become involved. The victim's final story can often be told with the information gathered.

Blood Spatter

Blood is a liquid and is subject to the laws of physics. Trained investigators use reagents to detect the presence of blood, and interpret any patterns left by blood.

Contamination Control

Have you ever wondered why investigators wear the funny white bunny suits at crime scenes? Investigators need to ensure that the evidence collected at the scene originated with those present at the time of the crime and not at a later time, so they control the introduction of contaminants. Every person who enters the scene could bring contaminating transfer evidence that was picked up at other locations.

Controlling against this introduction of contamination is one reason you might be confronted with the familiar yellow police tape at a crime scene. The funny white suits serve the same purpose -- protecting the scene from contaminants.

DNA

DNA is still a fairly new forensic science that continues to develop at a rapid pace. Forensic Identification Unit members are trained to properly collect and preserve DNA evidence for analysis by the RCMP Laboratory. As techniques improve, the amount of sample needed to identify DNA is becoming smaller and smaller.

Fingerprints

Forensic investigators are trained to detect, preserve, and collect fingerprints, and to identify the source of these prints.

There are a number of different types of fingerprints, some of which include visible, latent, moulded, take-away, and deposited. To detect these prints, members use a variety of

techniques, which include the use of powders and florescent powders, alternate light sources, and chemicals.

Investigators receive extensive training in fingerprint comparison and become experts in identifying individuals from fingerprints recovered at crime scenes.

Footwear Impressions

Footwear can be identified in much the same manner as fingerprints. When footwear is manufactured, the sole pattern is unique to that shoe or boot style. This pattern is known as a class characteristic. As soon as it is worn, footwear develops wear patterns that are unique to the owner and the surfaces walked on, known as accidental characteristics. The uniqueness of these two characteristics can enable footwear to be identified.

If impressions or prints of the suspect's footwear are left at the scene, investigators can collect this evidence and attempt to compare it to the footwear of a known suspect.

Hair and Fibre Collection

Hair and fibres transfer between the victim, suspect, and crime scene. Using a variety of techniques, these items can be collected for later comparisons by the crime lab.

Photography

Forensic Identification Unit members are trained in a variety of photographic techniques in order to record evidence found at scenes and to record procedures used in recovering it. Some of these techniques include:

- night photography
- studio photography
- aerial photography

Scene Measurements and Scale Drawings

Measurement of crime scenes is also a skill required by investigators. A variety of tools and instruments are used to collect the measurements of each major scene. This information is then used to generate scale drawings, either on a computer using CAD or in some cases on the drafting table by hand.

Tire Impressions

Tires also have class characteristics and develop accidental characteristics for the same reasons as footwear. Tire impressions can therefore be identified in the same manner.

Tool Mark Castings

Tools can be compared to marks left at crime scenes. Forensic Identification Unit members can take castings of marks found at scenes for later comparisons by the crime lab.