The work of the Microanalysis unit encompasses the widest range of evidence types among the sub-disciplines in the CLD. Results of these examinations may help to substantiate or refute a victim’s story, a suspect’s alibi, or a theory of how events may have transpired. The analysis may offer investigative leads such as the type of automobile in a hit-and-run, the objects a bullet passed through in a shooting scene, or geographic location where an object may have previously been. Trace evidence exams are based upon the concept of Locard’s Exchange Principle, which states that whenever two objects come into contact, a transfer of material will occur.

The Microanalyst keeps in mind both the big picture as well as to focus on the small details. The Microanalyst is an expert at pattern recognition and hone those skills to find that needle in the haystack (or, more appropriately, the one paint particle in a cup of debris collected off a blanket or at an accident scene). The scientist understands the manufacturing process of materials, the mechanisms of transference of trace materials, and how common a given material is to a specific environment.

Trace evidence usually is not involved in the identification of evidence to a specific person, but rather often offers investigative information on evidence items (what is it or what does it mean) or comparison information between a question item and a reference sample (could these two items have been in contact?).

The CLD Forensic Services Guide (www.wsp.wa.gov/forensics/docs/bureau/forensic_services_guide.pdf) offers a good description of the evidence types encountered in the Microanalysis Section. The FSG also has instructions on collecting reference samples and identifying potential evidence.

Did you know that our scientists handle diverse evidence such as vehicle lamps, duct tape, food residues, and botanicals?

Microanalysis Evidence Analysis

Providing all information on the RFLE (Lab Request) helps us to route and prioritize evidence to the appropriate sections and scientists and gives us contact information for questions.

Remember your email address on the RFLE!

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Paint

Paint is a common type of physical evidence encountered in the forensic laboratory. Paint films are characterized by a number of physical and chemical features. The physical characteristics may include color, layer sequence and thickness, surface and layer features, contaminants and weathering. Chemical components may include pigments, polymers, additives and solvents. These features can be determined and evaluated by a variety of macroscopic, microscopic, chemical, and instrumental methods. The information obtained from these determinations can be used to provide investigative information or to compare known and questioned samples.

Possible sources of paint evidence include but are not limited to vehicles, buildings (interior and exterior painted surfaces), tools, appliances, cosmetics, and roadways.

Spray paint is interesting because it forms small balls due to the aerosolization process. On the Green River homicides, small paint spheres were observed by WSP Tacoma Lab Staff on the clothing of several of the victims. Such spheres are formed when aerosol paint dries as it travels through the air. Subsequent analysis showed that this paint, manufactured by Imron, was consistent with that used by Gary Leon Ridgway in his work as a paint sprayer with Kenworth Trucks in Seattle.

Case Story: Fibers & Fabric Impressions

Early in the morning on August 13, 2006, the SUV Mary Rivas was driving collided with the patrol car of rookie Seattle Police Officer Joselito Barber. Officer Barber was killed in the collision.

At the scene, Ms. Rivas was found seated in the passenger seat of the SUV. She claimed that she was the passenger and that the driver had run away from the scene leaving her there. Ms. Rivas was taken to the hospital.

Her red polyester/cotton sweatpants were submitted to the crime laboratory along with the lower part of the dashboard of the vehicle and a tapelift of fibers recovered from the lower part of the steering wheel. These items were examined by Forensic Scientist Margaret Barber (no relation to Officer Barber).

After chemical and microscopic comparisons were made, the following results were found: Red cotton fibers on the steering wheel and embedded red polyester and cotton fibers on the lower parts of the dashboard near the steering column were similar (see page 3).

Photographing Impressions Evidence

It is always best to submit an impression directly to the lab, but if that is not possible and you need to submit photographs, here are a few steps that will help the Micro section in its analysis:

- Use a tripod and include an “L” shaped scale in the photographs. Put the scale at the same depth as the impression.
- The photograph needs to be taken from directly above the impression to prevent distortion of the photograph.
- Take several photographs of each impression using oblique (side) lighting. This gives us more opportunity to identify the identifying characteristics in the impression, and
- Submit the CD as a sealed evidence item.
FAQ for Microanalysis

Q: Do you offer any training on how to look for and package trace evidence?
Yes, we are happy to provide your agency with a presentation of the types of exams we can perform, how to look for the evidence, and how to package the evidence. Give us a call and we can arrange a time and place.

Q: Should I send in a copy of our agency’s report when we submit evidence?
Yes, by all means, please do. The background information you provide may help us recognize other types of exams and other types of evidence that may help your case.

Q: What if my evidence needs to be analyzed by multiple subdisciplines?
Microanalysis cases generally involve crimes against people and/or property and typically involve multidisciplinary examinations. Our unit’s forensic scientists are careful to review the Request for Laboratory Examination form and contact the detective/agency to obtain pertinent case information and specific information about the submitted evidence. After this discussion with the detective/agency, our experts then work with forensic scientists from the other subdisciplines, such as DNA, Firearms and Latent Fingerprints, to determine the best approach and order of examinations.

Q: What types of materials can you compare?
We can compare all types of materials, including fibers, paints, and tape, just to name a few. The significance of the comparison is dependent on case details as well as the type of material compared.

Q: Why did you discontinue examination of glass?
We recently discontinued glass comparisons for the time being due to limited resources. We can still examine and identify glass, but at this time, we cannot make glass comparisons to known sources.

Clothing Damage

Damage assessment exams many times can aid in the direction of the investigation. There are numerous types of materials that can be submitted for damage assessment examination, but the majority of the evidence examined is of clothing/textile construction. This type of examination on clothing submitted for analysis can often determine if the damage was incident to a struggle (tearing or ripping), a strong impact, projectiles, knives, or from normal wear and tear. Mechanical damage is the form of damage usually examined; however, chemical and thermal damage are also encountered.

Results of damage assessment exams may substantiate and/or refute a victim’s story, a suspect’s alibi, or an officer’s theory of how events transpired. Damage assessments may put the victim in contact with the suspect’s car or may aid the investigator in determining who was driving a vehicle when an accident occurred. Damage assessments may also aid investigators to locate and/or identify suspect weapon/implement(s).

Case Story: Fibers & Fabric Impressions Continued

to the red polyester and cotton from the sweatpants. The grey brown material on both the left and right knees of the sweatpants was similar to the grey brown material of the dashboard. Also, the shape of these grey brown deposits on the sweatpants was matched directly to the shape of the scuffed areas on the dashboard below the steering column. A small fabric impression on the dashboard in one of the scuffed areas was also consistent with the weave of the sweatpants. The results of these analyses show that the suspect, who was wearing the sweatpants, was actually the driver of the vehicle at the time of a forceful impact.

Mary Jane Rivas pleaded guilty in September of 2007 to vehicular homicide and possession of cocaine with an exceptional sentence of more than 20 years in prison for “rapid recidivism”.

Fiber comparison
Forensic Services Guide and Trace Evidence

As much as possible, do NOT use staples in packaging evidence. Staples are not accepted as proper seals, and they offer too many chances for injury. If staples are used to close packages, be sure to cover the staples with tape.

Be careful in packaging trace evidence. Package and seal the containers to avoid leakage, tearing, or the sifting of evidence through cracks or small openings. Consider a double package process to protect trace evidence from being lost in a larger outer container.

When submitting evidence to the lab, list the items in order of priority (the order in which the requester would like the evidence examined). Use item numbers that are assigned at the time of collection and a very brief generic physical description to identify the item.

Use universal precautions when handling biological specimens or stains (i.e., act under the assumption that the specimen or stain contains a dangerous pathogen. Use appropriate protective equipment, such as face, eye, hand, and shoe protection. Pointed and sharp-edged objects must be handled with extreme care. Blind searches are definitely to be avoided. Searchers must not place their hands into any space that is not first visually inspected. Eyes must be protected if splashes are likely to occur.

Submitting a case summary with evidence offers an opportunity for the scientist and case investigator to recognize other types of exams and other types of evidence that may help your case.

Little bit more from the FLSB—Happy Thanksgiving!

- The Crime Lab Division CODIS Laboratory has produced its latest newsletter for DNA collection agencies. To view the latest newsletter and other 2010 newsletters, please visit the CLD webpage: (CODIS Newsletter Oct 2010).
- The CODIS lab offers on-site training to our convicted offender DNA collection agencies and other interested criminal justice groups. The training takes approximately one hour and covers basics about CODIS and the ins and outs of offender DNA sample collection. The training can be tailored to focus more on background behind the database and details regarding current legislation on convicted offender DNA sample collection. For more information, contact the CODIS laboratory email (confel@wsp.wa.gov).
- The CODIS lab has also produced a new video for DNA felon sample collection. This video is available at CJTC elearning site and offers continuing education credits (www.cjtc.state.wa.us).
- On August 27, 2010, the WSP Crime Laboratory Division received word that each of our 8 laboratories has been accredited through the ASCLD/LAB International program for forensic laboratory accreditation. This is our 6th accreditation and our first using ISO (International Organization for Standardization) criteria. The accreditation program offers a strong baseline program for assuring the quality of the work from each laboratory. Each member of the division worked very hard to achieve accreditation and we are very proud of this accomplishment.
- The CLD will be offering the next Marihuana Technician refresher classes in early 2011. Those who are already marihuana technicians will be required to attend one of the refresher classes. More information will be available in the near future. We will also be scheduling a Marihuana Technician class for new technicians, probably in the summer. More information on this class will be provided in the spring.

Catch us on the Internet
http://www.wsp.wa.gov/forensics/flsbhome.htm

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Fall leaves on Bainbridge
Photo Courtesy of Mitch Lant