CACNews

ifornia Association of Criminalists • Second Quarter 2016

SCIENCE IN ACTI
"CRIMINALISTICS
24:05

TRANSCRIPT

NARRATOR:
A crime has b
were no witnesses. W
Will the criminal be a
ed? This is a job for scie
many thousands of othe
laboratory--by scientists using the principles of
virtually all of the physical and biological sci-
ences.

The evidence is here: Some obvious, some
unseen. But the scientists, the criminalist, will
use every bit of it to supply facts which will
identify and convict the criminal. For today, the
science of criminalistics has become a powerful
weapon in the war against crime.

The field of criminology includes all as-
pects of crime detection and
But the science of criminalist
the role of scientific evidence
tion of justice.

be solved in the

criminal trials.

KIRK:
Criminalistics is both a profession and a sci-
entific discipline. We are concerned with the study
of physical evidence. That is, physical objects and
physical facts relevant to the crime from which
a reconstruction and understanding of the crime
may be developed.

Everything can be evidence. Organic, inor-
ganic, biological, manufactured...just about any-
thing on earth or in the air. As yet we've never
had to deal with evidence from outer space, but we
probably will someday.

chris
Coleman

CAC President

It took me back to those days when I was still going to school and on the outside looking in at forensic science. Back then it was fresh and new in my mind and took on a very romantic and exciting feeling. Like a new lover.

The Newness

Wow! The year has flown by! It's seems like yesterday I was dressed up like a pirate and accepting the coconut as president from Greg. Pretty soon I will be passing the coconut on to Brooke. While I reflect back on this past year, I can happily say it was a good year for the CAC. Part of the reason for that is because of the amazing people on the board. I want to thank each of them for the incredible job they do. As president, I may be the face and figurehead of our association, but the members of the board are the force behind what makes our association so great. Thank you Brooke, Greg, Michelle, Kirsten, Jamie, Alice, Helena, and Meiling! You are the best! I appreciate all the hard work you do for the association. I also want to thank John Houde for our incredible *CACNews*. Thanks John!

I also want to thank all the members of the association. Our membership is what makes our association great. It has been an honor to be your president. Thank you for the hard work you do everyday and the advances in forensic science that you help develop. Our profession benefits from the many contributions our members make.

Speaking of the profession, I spoke with a friend recently about her daughter, a senior that graduates this spring. Her daughter wants to go into forensic science and wanted some insight into the best route to take in college and to get a feel for the profession. It was refreshing to listen to the questions from such an innocent point of view. And by that, I mean one not tainted by the politics, legal restrictions, accreditation standards, and policies that guide our everyday work. Just pure science. It took me back to those days when I was still going to school and on the outside looking in at forensic science. Back then it was fresh and new in my mind, and took on a very romantic and exciting feeling. Like a new lover, everything was fantastic. As I began to work in the field we became more familiar, like partners who have been together for a while. The spark was still there, but it wasn't as strong as it had been when everything was new. And after a while things settled into a comfortable routine. It didn't happen over night, but in time things became "stable" with bits of interesting thrown in randomly. Answering those questions for someone wishing to get into forensics brought me back to those days when it was exciting again! It also reminded me how much forensic science has evolved over the last twenty years and where we appear to be headed in the near future. Sometimes, I'm still amazed that I have worked in this profession for half my life. That's driven home even more when people find out what I do and seem in awe that they met someone who works in our profession. Sort of like how I feel when I meet someone

please turn to page 26

The CACNews
www.cacnews.org

SECOND QUARTER 2016

Frame Grabs

A few scenes from the California Academy of Sciences educational series, "Science in Action," featuring Paul Kirk. The complete transcript is printed in this issue. The video is available for download from cacnews.org.

Editor Meiling Robinson
editor@cacnews.org

Art Director John Houde/Calico Press, LLC
(206) 855-1903
john@calicopress.com

Webmasters Mark Traughber, Eric Halsing
(951) 361-5000
webmaster@cacnews.org

Advertising Contact the Editor

The *CACNews, ISSN 1525-3090,* is published quarterly (January, April, July, and October) by the California Association of Criminalists (CAC).

The CAC is a private foundation dedicated to the furtherance of forensic science in both the public and private sectors.

Please direct editorial correspondence and requests for reprints to the editorial secretary.

Notice to Contributors: We publish material of interest to our readers and are pleased to receive manuscripts from potential authors. Meetings and course announcements, employment opportunities, etc. are also solicited. Advertisements are also accepted, although a fee is charged for their inclusion in *The CACNews*. Please contact the advertising editor for further information.

Submissions should be made in the form of Windows compatible files on CD or by e-mail. Alternatively, text files may be saved as plain ASCII files without formatting codes, e.g. bold, italic, etc. Graphics, sketches, photographs, etc. may also be placed into articles. Please contact the editorial secretary for details.

The deadlines for submissions are: December 1, March 1, June 1 and September 1.

INSIDE

Discount Offered for CAC Members

Cambridge Healthtech Institute's (CHI) Inaugural DNA Forensics: Exploring New Frontiers in Forensic DNA Investigation will be held August 23-24, 2016 at the Grand Hyatt Hotel, Washington, D.C. Please visit (www.nextgenerationdx.com/DNA-Forensics) and Mention keycode CACFDX to save 15% off your conference registrations. Valid for new registrations only.

MAFS Announces Annual Meeting

The Midwestern Association of Forensic Scientists announces their annual meeting for October 3-7, 2016. It will be held in Branson, Missouri at the Hilton Branson Convention Center. To book, visit conventioncenter.hiltonsofbranson.com and use(Group Code: MAFSMO). This meeting is hosted by the Missouri State Highway Patrol and the contact person is Abigail Lehman 573-526-6134 x2529, abigail.lehman@mshp.dps.mo.gov. See more at www.mafs.net/news-feeds-1/mafs-2016-meeting.

Featured events include workshops, break-out sessions, and posters for analysts in Drugs, Toxicology, Trace Evidence, Crime Scene, Biology, Questioned Documents, Latent Prints, and Firearms/Toolmarks.

MRI Launches a New Online Text

McCrone Research Institute announces its new online publication, A Modern Compendium of Microcrystal Tests for Illicit Drugs and Diverted Pharmaceuticals, which fulfills a critical need for reliable analytical methods and assists forensic scientists and other researchers in their work.

This compendium contains 19 drugs for which microcrystal tests using various reagents have been previously developed. It describes in detail the microcrystals formed from each test and includes photomicrographs, morphology illustrations, optical properties, notes and infrared (IR) spectra of the microcrystals.

Microcrystal tests, using polarized light microscopy (PLM), can identify most illicit drugs specifically and quickly, and they are inexpensive compared to other methods. In addition, proper use of the light microscope and microcrystal tests can check and confirm the results obtained by alternative methods.

Learn more and download the Modern Compendium of Microcrystal Tests at www.mcri.org.

Correction

The 1st Q 2016 issue of the *CACNews* listed a microscopy couse offered by McCrone as "online." This referred to the registration and not the actual course.

FIND YOUR OASIS IN FORENSIC SCIENCE

CAC & ASTEE Joint Meeting

2016 Fall Seminar

HOSTED BY: CA DOJ RIVERSIDE LABORATORY

OCTOBER 31 – NOVEMBER 4, 2016

OMNI RANCHO LAS PALMAS RESORT & SPA

RANCHO MIRAGE, CA (PALM SPRINGS AREA)

meiling
ROBINSON

CAC Editorial Secretary

You start to worry, "is there going to be enough money to pay for this?!" Things start to feel like they are careening off track; you see too many little details unaddressed.

SEMINAR CHAIR

or, (The Unexpected Virtue of Ignorance)

For this edition of the *CACNews*, it was requested that I tell the unsung story of the designated host laboratory Seminar Chair. A lot of questions arise when you find out your laboratory has volunteered to host a CAC seminar. How do you select a host hotel? What dates should be selected? What will be the theme? And of course, who's going to be seminar chair? Generally, the seminar chair is either the volunteering party or other department designee. This person is commonly in a supervisory position; but they can also be, as in my case, a bench criminalist who is involved in the CAC.

When I initially found out my laboratory was going to host the CAC, I was thrilled. More than 10 years have elapsed since the last time LAPD hosted, and this year happens to be a most befitting time for our laboratory to host. Recently, the LAPD Scientific Investigation Division (SID) underwent a metamorphosis. It was decided that the two laboratories that comprised SID, the Criminalistics laboratory and the Technical laboratory, be separated into two new divisions. The Technical lab, including the Latent Prints, Photography, Polygraph, and Electronics Units, became the Technical Investigation Division (TID). While the Criminalistics lab including Questioned Documents, Field Investigation, Firearm Analysis, Narcotics Analysis, Serology/DNA, Toxicology, Trace Analysis, and Quality Assurance Units, became the Forensic Science Division (FSD). Much like debutantes at a cotillion, by hosting this seminar, FSD will be (re)introduced to society in resounding declaration—"We have arrived!"

Additionally, as the laboratory that services the city of Los Angeles, we are currently facing some difficult challenges. After years of declining crime in the city, the latest reports reveal a 12.7% increase in overall crime from 2014 to 2015. This reported "uptick" in crime has materialized as increased casework loads for analytical units and more Field Investigation Unit call outs. Since many surrounding cities and neighboring counties are also experiencing increases in crime, it's ideal that LAPD host not only a CAC seminar but also a CACLD seminar in our centralized location. Together we can discuss and face the many challenges that these increases in crime may present to our laboratories.

Now, back to the responsibilities of the seminar chair. Being chair means wearing many, many, many hats. Like a 15 lb. Bag of Holding worth of hats—event planner, accountant, lawyer, motivator, team captain, publicist, time guardian, lab representative, manager, public speaker, just to name a few. Not to mention your primary duty as a criminalist, and any additional professional responsibilities, as in my case, serving also as CAC Editorial Secretary—two more giant hats.

Being appointed seminar chair, is a tremendous honor, but also a daunting task. Thankfully, you don't go it alone. The Seminar Planning Committee (SPC) is immensely helpful in providing resources and guiding you through the process of planning your seminar. Your first contact, after being designated as chair, will come from the SPC chair, in my case Eucen Fu. He is instrumental in the early stages and throughout the seminar planning. Your very first tasks as chair include hotel site inspections, selecting a hotel, and negotiating a contract with that selected hotel. During the first month, Eucen introduced me to Janice Sturm, National Account Manager with Experient (www.experient-inc.com). Janice is your intermediary, advocating on your behalf during the contract negotiations with the hotel. The best news is that even after the contract is finalized, she works with you for the duration of your relationship with the hotel, ensuring with the utmost satisfaction that you and the hotel are on the same

These groups of co-workers, who voluntarily agree to help you, are invaluable to you. When they agree to join you on this yearlong journey, they are agreeing to do more work on top of their already large caseloads, and ceding time in their already busy schedules to go to your meetings. I do not underestimate their generosity. I am thankful. My committee is awe-inspiring. They are hardworking and I am grateful for their dedication and commitment to me, and more importantly to our seminar. They make my job easier, not easy—nothing about this is easy.

page with regards to your contract. In my opinion, Janice is highly professional, effective, thorough and an all around pleasure to work with. Her working relationship with CAC seminar chairs has been long-standing and stellar.

In addition to the SPC, you will develop your own in house committee, as outlined in the seminar planning guide. This is your *A-Team*, the *Showtime Lakers*, and *X-Men* all wrapped up in one unstoppable fantasy team. They're the Untouchables to your Eliot Ness, the Fellowship to your Frodo… you get the point, fill in your favorite example of teamwork here. These groups of co-workers, who voluntarily agree to help you, are invaluable to you. When they agree to join you on this yearlong journey, they are agreeing to do more work on top of their already large caseloads, and ceding time in their already busy schedules to go to your meetings. I do not underestimate their generosity. I am thankful. My committee is awe-inspiring. They are hardworking and I am grateful for their dedication and commitment to me, and more importantly to our seminar. They make my job easier, not easy—nothing about this is easy.

As chair, it's my job to make sure we stay on task and meet specific goals of the planning process, which in the end should enable us to execute a successful seminar. (Queue up chaotic jazz music à la *Birdman* or *Whiplash* soundtracks). You juggle your many hats, moving from one "To-Do" to the next. At times you feel that the challenges are insurmountable. You're on call for the week, not getting any real restful sleep for three consecutive days because you've responded to scenes each night, and it is *only* Wednesday. You have your casework, reports to write, and detectives to follow –up with. Oh, by the way, your CTS test is due in less than two weeks; let's add that to the list. You decon your boots, re-stock your kit for the next potential call out, and you realize you need to schedule your next planning committee meeting. Put on the Seminar Chair hat now. First, let's check the timeline, follow-up on the progress of the action items from last meeting, and create the next meeting's agenda. Then there are the hotel registrations that need to be cross-referenced to the seminar and workshop registrations. "Why are there so few registered?" You start to worry, "is there going to be enough money to pay for this?!" Things start to feel like they are careening off track; you see too many little details unaddressed. Quick, meeting with your co-chair, workshop coordinator and budget coordinator, let's talk this out with them. After your mini meeting with them, you regain your composure, confidence and the train is back on track. (Cut the music.)

I owe my sanity to my co-chair, workshop coordinator and budget coordinator. These three amazing women, Shannan Kelly, Julie Wilkinson, and Amanda Phelps, are my pillars. I dole out tasks, and they're done. I need help, and they're the first to offer it. They keeping me standing during the bad days, always reminding me that together we'll work it all out.

There will be many bad days as Seminar Chair. Many of these moments also involve worrying. One hundred and twenty seven seminars, and you don't want to be the first chair that besmirches that exceptional record. Like the mocking, critical inner voice of Birdman, the looming cloud of failure follows you. It will literally make you question your sanity. Luckily, most days are days in which I take everything in stride. I simply do because I must. Even through all of the chaos, it's an experience worth being apart of. I'm looking forward to the week of this seminar; to see the hard work of those serving on committee all come together. My advice to you, if you are asked to be seminar chair, is that you should simply say, "Yes!"

By virtue of my sheer ignorance to the responsibilities of seminar chair, I merited a valuable lesson in teamwork. And I'm constantly learning more about teamwork with each passing day. Teamwork is more than just completed tasks and accomplishing goals together, it's depending on others, trusting others, learning what those around you need and knowing what they're capable of doing. As seminar chair, I'm thankful to Eucen Fu and the SPC, Janice Sturm, my LAPD committees and the "Trinity", Eric Halsing (CAC Webmaster extraordinaire), the CAC Board and my management at LAPD for supporting me.

Additionally, I'm grateful to John Houde and Greg Matheson for their mentorship and guidance during my term as CAC Editorial Secretary. John has been a great motivator, bestowing me with the courage to share my opinions in this forum. I'm thankful to Carolyn Gannett for stimulating much needed dialogue about ethics. Issue after issue, her column "Ethical Dilemmas" challenges us to confront important ethical questions surrounding difficult situations we may have already experienced, and many more we may have yet to face. She is giving us the great gift of preparedness. I'm also thankful to the many others who lend their opinions and share their work in the *CACNews*. I recognize that I alone cannot accomplish any of this, as seminar chair nor as Editorial Secretary, without the teamwork and willing cooperation of so many other people. Thank you.

Available on the cacnews.org website, the entire movie can be viewed as a downloaded video. Here's the transcript to give you an insight into Dr. Kirk's world.

Science In Action: "Criminalistics"

TRANSCRIPT

NARRATOR:

A crime has been committed, and there were no witnesses. Will this crime be solved? Will the criminal be apprehended and convicted? This is a job for science. For this crime, like many thousands of others, will be solved in the laboratory--by scientists using the principles of virtually all of the physical and biological sciences.

The evidence is here: Some obvious, some unseen. But the scientist, the criminalist, will use every bit of it to supply facts which will identify and convict the criminal. For today, the science of criminalistics has become a powerful weapon in the war against crime.

The field of criminology includes all aspects of crime detection and law enforcement. But the science of criminalistics deals only with the role of scientific evidence in the administration of justice.

When a crime has been committed, and the criminalist becomes part of the investigatory team, all the principles and techniques of science are concentrated on the evidence.

An outstanding scientist in this field is Dr. Paul Kirk, criminologist, crime consultant and one of the country's best-known expert witnesses at criminal trials.

KIRK:

Criminalistics is both a profession and a scientific discipline. We are concerned with the study of physical evidence. That is, physical objects and physical facts relevant to the crime from which a reconstruction and understanding of the crime may be developed.

Everything can be evidence. Organic, inorganic, biological, manufactured...just about anything on earth or in the air. As yet we've never had to deal with evidence from outer space, but we probably will someday.

Whenever possible, we like to collect the evidence ourselves at the scene of the crime. We must try to find all of it that is relevant and collecting it, so that you don't damage it or contaminate it, is a specialized task that often requires specialized equipment.

Some of the evidence at the scene of the crime would be obvious to anyone. But for some of the most important clues, only an expert would think of looking for them or have any idea what he could learn from them in the laboratory. You'd be amazed at what these tiny witnesses to a crime can tell us under a microscope.

NARRATOR:

How do you learn to be an expert--a trained, qualified criminalist? Dr. Kirk is the authority who can answer that question, too. For he's a scientist, a biochemist, as a matter of fact, who wears two hats: Crime consultant and professor of criminalistics at the University of California's School of Criminology.

This school, on the Berkeley campus, is unique in the United States because there aren't any others like it. And students come from literally all over the world for study and research.

KIRK:

This morning, class, we're going to consider the question of the comparative value of different types of evidence. And we're going to use one specific case to illustrate it in which there are four types of evidence. That is, there is glass, wood, a blood stain, and hair. Those four. We have a suspect in custody who must be released in some thirty hours or arrested...

NARRATOR:

Before you can get into this school, you have to have a solid foundation in general science. Because the more you can learn about chemistry, physics, biochemistry, botany, biology, immunology, organic chemistry, toxicology and the other related scientific disciplines, the better criminologist you'll turn out to be.

KIRK:

Tom, what would be your order of...this evidence under the conditions?

STUDENT:

In this case, where speed is of the utmost importance, I would first examine glass and blood because they're relatively the fastest to examine. Thirdly I would examine the hair and last of all, wood.

KIRK:

And would you rate the order of the value of the evidence in the same way?

STUDENT:

Well, I would value glass and hair about equal with blood following in the third position and hair being rated as least valuable of the four.

KIRK:
Why would you put glass and hair as the equivalent value?

NARRATOR:
There's much to learn. You can get some of it from textbooks and in class discussions, but the real things you're going to do as a practicing criminalist are accomplished in the crime lab with your hands and your eyes. And the students keep the school labs busy from the early morning until late at night.

They don't work with real evidence from actual cases because it is retained by the district attorney even after a case is solved and closed. But samples of all kinds are provided, and the students perform both physical and chemical tests to examine and identify thousands of known and unknown materials.

How is a crime solved in the lab? What can you learn from a single strand of hair? A bit of fiber or metal? A tiny fragment of glass or a drop of blood?

KIRK:
Blood is one of the most frequent and important types of evidence encountered in criminal investigation. And we find it at the scenes of crimes of violence about ninety-five percent of the time. When we find a visible or an invisible stain, we take it to the laboratory to find out if it is blood. There are several very sensitive and rapid catalytic tests we can use to find out if a drop, stain or smear is blood. Of these preliminary color tests, the most widely used is the benzidine test. It works with extremely minute quantities of blood and it's an excellent presumptive test.

The stain is blood. But is it human or animal? We can find out the origin of blood by a simple test often used by immunologists. It is based on the fact that an animal normally can tolerate only its own types of proteins and employs the same type of reaction effective in natural immunity to disease.

The serum of the blood an animal which has been immunized to human blood is layered with a little of the questioned blood. If a precipitate forms, as a white band at the interface, it's proof that the blood is from the same origin or species as was used to immunize the animal. A properly performed precipitin test will give positive proof of whether the blood is human or animal.

NARRATOR:
A spot of blood may help to convict a criminal or exonerate an innocent person when it is tested to determine its international blood group. There are four: Known as A, B, AB and O. And everyone's blood is in one of these categories. In the United States, only three percent have AB type. So, if the sample is type AB, about ninety-seven percent of the population can be eliminated as suspects.

With other tests, the drop of blood can be individualized even further. Since identification is essentially a matter of elimination, with each specific step, more and more people can be ruled out. Until, ideally, you end up with the one and only person who could have possibly committed the crime.

KIRK:
By use of electrophoresis, the protein distribution of the blood can be checked and compared with other specimens.

NARRATOR:
Having placed a drop of sample on paper strips, an electric current is applied to them. After the strips have been dried and been stained, the protein distribution of the blood can be compared with other specimens.

KIRK:
Going one step further, we can test blood for differences in immunological characteristics. For example, immunity to measles.

NARRATOR:
After separating the proteins by electrophoresis, antiserum is applied to the strip. The antiserum diffuses into the separated blood proteins. Precipitin arcs are formed as a result of the precipitating activity of the antiserum. These arcs may be compared to show possible differences between individuals.

KIRK:
No two individuals have the same kinds of immunity in the same proportions. By learning more about the composition and behavior of blood, we eventually expect to be able to identify an individual by his blood as certainly as by his fingerprints.

NARRATOR:
One of the most important parts of a criminalist's training is learning to recognize common material or microscopic evidence found at the scene of the crime.

KIRK:
It is virtually impossible for a person to commit a crime without leaving microscopic evidence behind and carrying microscopic evidence away. This evidence may be the only clue to the criminal's identity, and frequently it's the only conclusive proof of guilt or innocence.

Microscopic evidence is largely obtained from the filter of the vacuum sweeper used for collecting debris from crime scenes and especially from clothing. The material is place under the stereoscopic binocular microscope where the sweepings can be readily scanned or minutely examined by teasing the mass apart with dissecting needles. We use this microscope to examine ninety-five percent of our evidence. You might say it's the beginning of all good laboratory procedure.

Each particular type of evidence is picked out with fine-tipped forceps and placed in the individual side wells.

NARRATOR:
What can you learn from a pile of sweepings that will help you find a criminal and solve a crime?

TEACHING ASSISTANT:
How're things coming along, Mary Lou?

STUDENT:

I've been making some progress. I've sorted out all the things I think will be significant as evidence. For instance, there's some textile fibers, some metal and wood fragments, some paint chips and glass fragments, and some hairs which may turn out to be animal or human. Perhaps the most important thing I've found is something that looks like marijuana...

KIRK:

The study of microscopic evidence requires patience, perseverance blended with skill and experience. But the rewards make it well worth the effort. Microscopic evidence is capable of proving facts of great significance and no attorney, no matter how clever or dramatic, can ever obliterate the effect on a jury of one proven and significant fact.

NARRATOR:

Microscopic particles of hair and fibers are important clues in many criminal investigations. They cling to garments in spite of careful brushing and cleaning and they can be found in cuffs and pockets which appear absolutely clean. Sometimes they can be authoritative witnesses to the identity of the criminal.

KIRK:

Fibers of unknown origin will ordinarily be obtained from clothing, sweepings, or from the locale of the crime such as the windowsill or edges of broken glass, nails or other irregularities that have snagged clothing or other cloth objects. They may be found when there is no other significant evidence.

A criminologist must be thoroughly familiar with the identification of common textile fibers. Cotton, for example, is a flat fiber showing a characteristic twist similar to the appearance of a twisted ribbon. The cellular structure is readily seen in most cases. Wool is characteristically a hair. Usually showing no medulla and with very noticeable transverse scales on the narrow fibers ranging to almost complete absence of visible scales on the large fibers. These scales give to edge of the fiber a characteristic notched appearance.

NARRATOR:

Hair is a tiny but telltale clue that can usually be found in connection with half of all the crimes committed. But what can you learn from a fragment of hair that will help you describe and identify a criminal?

Under your microscope magnified many times, a hair might reveal these facts: Whether it's human or animal, and the species of animal. If it's a human hair, the race and probable sex of the individual; whether it fell out or was torn out or cut off; the part of the body from which it came; the natural color or whether it bleached or dyed, and the treatment it received from the barber or hairdresser.

KIRK:

Our criminalistics students examine many samples of hair to determine origin and characteristics. Basic to their examination is microscopic analysis and scale counts.

NARRATOR:

Glass fragments from a broken window are found at the scene of a crime. A minute glass particle is found embedded in the sole of a suspect's shoe. Is the glass identical? Is this the criminal? Glass is a very complex material with many variations in composition.

KIRK:

The chemical variations occurring in glass are reflected in differences in their physical properties. One of the physical properties which is useful in comparing glass fragments is density. Few substances have exactly the same density. Therefore, different samples will settle to different levels if dropped into a column of liquid which is of gradually diminishing density from bottom to top.

NARRATOR:

The principle was discovered by Archimedes some time before 215 B.C. But it was adapted for criminal investigation work by Dr. Kirk.

KIRK:

It is allowed to stand for twenty-four to forty-eight hours until the liquid levels merge and make a uniform gradient. Then the two bits of glass are dropped into the top of the tube. They slowly settle to points which correspond with their own densities. In this case the same level, indicating a possible common origin.

NARRATOR:

Did the glass in the suspect's shoe come from the scene of the crime? Guilt or innocence may depend on the criminalist's findings. So, the glass particles will be subjected to other tests as the careful investigator seeks absolute proof of common origin. You can find some of the answers with microscopes and test tubes but the criminalist also uses many intricate electronic and optical instruments to probe the mysteries of the many materials and substances he must identify and compare. And the students spend many long hours learning how to use complex equipment like this which can be used to perform almost any electrometric or photometric measurement.

KIRK:

The spectrograph is one of the workhorses of the crime laboratory for analyzing paint chips, metal fragments, soil comparisons and all types of small bits of mineral evidence. It is based on the principle of emission spectra and it's an ideal instrument for studying the identity of metals.

NARRATOR:

The experiment is to compare an unknown metal sample with a sample of known origin. Is a particle of metal found on the floor by a burglarized safe identical to the one found in a suspect's pockets? The method for comparison is based on registering photographically the spectrum of each of the samples.

KIRK:

When any element is heated to white-hot intensity, the light which it emits will produce a spectrum distinctive for that element. No two are alike. The lines and bands are different colors and in different positions. If two samples yield identical spectra in all observable particulars there is no doubt that they have identical chemical compositions.

NARRATOR:

Infrared absorptometry, very familiar to the chemist, is now being used extensively in the crime laboratory for individualizing organic materials.

KIRK:

The infrared spectrophotometer will identify any organic substance or mixture of compounds such as paint or plastics by drawing a chart of the sample's absorption of infrared light. We sometimes call it the fingerprint technique of chemistry.

NARRATOR:

The students in criminalistics work hard. They have much to learn. Study the facts; practice the laboratory techniques. But most important, develop a scientific attitude. Use your imagination, ingenuity, and curiosity. But balance them with skepticism, common sense and conservatism in your interpretations.

KIRK:

To be a good criminalist, you need a broad scientific background. Every natural science you can study will be valuable to you. And, you should in addition, adopt the permanent attitude of a student because you never will know all of the useful things that can serve your purposes.

In criminalistics practice, mistakes are not allowed. Testimony, once given, cannot be corrected by giving it a second time. As an expert witness you have to learn how to popularize science so that the jury can understand your testimony.

NARRATOR:

When you're in school, it's just an exercise, an experiment. But someday you'll be facing the real thing when a man's guilt or innocence, his life or freedom will depend on your findings.

A crime has been committed and there are no witnesses to describe the burglar; to identify a suspect; to testify and convict the criminal. Or are there?

A window glass has been broken inwards and its fragments litter the floor near the point where the entry was made. The lock area on an inside door is scratched and scraped apparently by some sharp tool or jimmy. Near the jewel case, a dirty handkerchief shows reddish stains. An old gray jacket, size extra large, is found in a corner near the case. On the jacket, and in the pockets, are several blonde hairs, blue cotton fibers, earth, sand, gray crushed gravel, bits of hay and straw and feather fragments. That's the evidence. Can you describe the burglar? Tell the police where to find him and what evidence to look for on a suspect? There are many tiny witnesses to the crime and science will get them to testify.

Description: Male, Caucasian, height: six feet, medium build, straight blonde hair, cut on the right hand, possibly wearing a blue cotton shirt and brown wool pants. Probable occupation: A laborer associated with building construction. He lives outside the town proper on a small farm or garden plot, raises chickens and keeps a cow or horse. When a suspect is apprehended, check for glass and metal fragments in shoes and clothing, and blood type AB.

In criminal investigation there are no pat answers. You never get asked the same question twice. Each case requires a new approach, a different technique.

KIRK:

The thing you need most is judgment, balance, experience. And some of it you have to learn the hard way.

NARRATOR:

Crime is perhaps the oldest problem that confronts mankind. But experts in criminalistics, like Dr. Paul Kirk, are finding revolutionary new ways to bring the guilty to justice and remove the shadow of suspicion from the innocent. Thanks to science in action in the crime lab.

END

CREDITS

24:05 (ca 1970) • Produced and directed by Dr. David W. Parker • Associate Producer Bob Olson • Written by Liz Everitt & Kay Heily • Cinematography by Bill Wescott • Audio by Gabor Kalman • Editor Steve Nagy • Unit Manager Sue Weaver • Science Advisor Dr. Paul Kirk, University of California • Produced by Science Films, Inc. • In association with The California Academy of Sciences, San Francisco, California • Color by Cine-Chrome

Ethical Dilemmas

Discussion Corner with Carolyn Gannett

Just Throw it Away 2.0

Great! So now I have to turn in my supervisor for unethical conduct.

Scenario

You are straightening up the evidence-processing room in your ASCLD/LAB-accredited lab when you discover a loose casing on the floor. It can't be from the scene you just processed, because no casing had been collected. You place the casing into an envelope and secure it inside your locker. As soon as possible, you tell the CSI supervisor of the stray casing, who orders you to just throw it away.

What ethical concepts may apply to how you might handle this situation? What would you do?

Discussion

A year ago (*CACNews*, 2015 2nd quarter) I presented a variation of this scenario. In that version, it was the CSI supervisor who found the casing, and then decided to discard it and say nothing. A discussion of ethical concepts that may have applied to the supervisor's decision can be found in that article. They include the following clauses from forensic science ethics documents:

Give utmost care to the treatment of any samples or items of potential evidentiary value to avoid tampering, adulteration, loss or unnecessary consumption. (ASCLD/LAB 11)

Present accurate and complete data in reports, testimony, publications and oral presentations. (ASCLD/LAB 14)

The modern scientific mind is an open one, incompatible with secrecy of method. (CAC I.C)

It is the duty of any person practicing the profession of criminalistics to serve the interests of justice to the best of his or her ability at all times. (CAC Preamble, paragraph 3)

Those same concepts may apply to the subordinate who is ordered to discard the casing. Superiors' orders do not excuse anyone from conforming to ethical standards, nor do they make subordinates any less culpable for their own actions.

In fact, a subordinate carries a heavier ethical burden than a superior when ordered to do something unethical. Because, not only does a subordinate answer to the same ethical concepts as a superior, several ethics documents also require the subordinate to report the superior. For example, ASCLD/LAB's *Guiding Principles*, #5 states:

Report to the appropriate legal or administrative authorities unethical, illegal, or scientifically questionable conduct of other laboratory employees or managers.

IAI (1.09), SOFT (G), and SWFS (5) have similar wording in their ethics documents.*

While the supervisor's order is not necessarily policy, the spirit of reporting its conflict with ethical concepts may be expressed also in ASCLD/LAB's *Guiding Principles*, #6:

The ethical and professionally responsible forensic scientist and laboratory manager…*Report conflicts between their ethical/professional responsibilities and applicable agency policy, law, regulation, or other legal authority, and attempt to resolve them.*

Similar wording may be found in the ethics documents of IABPA (4.1.4), IAI (1.06), SOFT (G), and SWFS (6).*

The *Guiding Principles'* clause #5 appears to leave it to the individual to judge whether another's conduct has breached ethics, legal statutes, or scientific values. It also appears to give the individual a choice of reporting bodies: "appropriate legal or administrative authorities." Note that "appropriate" is the only modifier to "legal or administrative authorities." Deciding what is appropriate is left to the individual's judgment. "Legal authorities" may include: local police department, local sheriff's office, local DA's office, Grand Jury, State Attorney General, US Attorney General, FBI, Equal Employment Opportunity Commission, American Disabilities Act, and perhaps others. "Administrative authorities" may include: laboratory management, agency management, human resources department, professional association boards, and maybe others.

Note that clause #5 does not offer the option to *not* report unethical, illegal, or scientifically questionable conduct. As worded, such conduct *must always* be reported.

You may be thinking: Great! So now I have to turn in my supervisor for unethical conduct. How is that going to look on an annual review? How delighted will promotional boards be about someone rocking the boat? Does anyone need a reminder about which way the proverbial brown matter flows?

You may be thinking: Great! So now I have to turn in my supervisor for unethical conduct. How is that going to look on an annual review? How delighted will promotional boards be about someone rocking the boat? Does anyone need a reminder about which way the proverbial brown matter flows?

These may or may not be factors in your particular situation. Regardless of any anticipated negative repercussions, if you answer to ASCLD/LAB's *Guiding Principles*, the document states quite plainly: report it. Period.

Be aware that there are other ethics documents that either offer criteria for determining when unethical conduct need not be reported, or remain entirely silent on the matter of reporting. Such documents might apply when dealing with the questionable conduct of someone who does not work in one's own lab. Note that ASCLD/LAB's clause #5 applies to "other laboratory employees or managers." This phrase appears to limit the individual's responsibility for reporting questionable conduct only to that occurring within one's own laboratory. So, if this is the only ethics document to which you answer, then you may have no ethical responsibility to report unethical conduct of anyone outside your laboratory—you might have a moral responsibility, but not an ethical one.

For more discussion on reporting unethical conduct see other articles in this series in the *CACNews* 2013 4th quarter and 2011 2nd quarter.

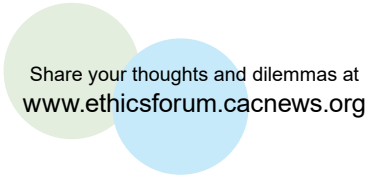
What Would You Do?

I encourage the reader to place his or herself into this scenario. Imagine all the real-life factors that could come into play given your particular working environment, and then answer in detail: "What would you do?" It's easy to say, "I'd report it." But, how? Verbally? In writing? To whom? Does anyone get cc'd? If so, who? What, if anything, would you document? What would you do if your report, whether verbal or written, gets shoved under the rug? What would you do with the casing?

If you think negative repercussions may occur, how might you anticipate and protect yourself from them? If you need help deciding on a course of action, who would you approach? (Note that professional associations' ethics committees are often tasked with assisting members with ethical dilemmas.)

Feel free to enter your thoughts in the CAC's Ethics Discussion Forum at www.ethicsforum.cacnews.org. I look forward to hearing your ideas.

*Acronyms: ASCLD/LAB: American Society of Crime Laboratory Directors / Laboratory Accreditation Board, IABPA: International Association of Bloodstain Pattern Analysts, IAI: International Association for Identification, SOFT: Society of Forensic Toxicologists, SWFS: Society for Wildlife Forensic Science



Kirk Was Late to the Game

A good friend of mine sent me a marked up copy of your newsletter. He suggested that I should point out an even wider gap in the (mis)history of criminology—an earlier term for criminalistics—than you highlighted in your Editor's Desk [*CACNews*, 1stQ 2016]. My friend, Mr. Jan Beck, is a retired QD examiner and does not "do" e-mail (actually he doesn't do computers at all).

* * *

In your column you noted that *Popular Science Monthly* mis-spoke when it said "in the whole United Stats there is no Sherlock Holmes." You then pointed out that August Vollmer, "Gus, was doing exactly that, and had a "pseudo crime laboratory." Not sure what you mean by "pseudo," but it was certainly "rudimentary," at best. And, of course, Vollmer was not a scientific criminologist himself, he was mostly an old-style "cop." He did not perform operations in the vestigial crime lab. Still, he does deserve credit for encouraging scientific methods and better education for police officers. (Amazing in itself since Vollmer had only a grade school education, supplemented by vocational training in bookkeeping, typing and shorthand.) From Vollmer, you jump to Paul L. Kirk as "the American archetype" in terms of criminalistics.

While Kirk certainly deserves recognition, he was—fact—very late to the game. Just in the West, there were two more pioneers besides Vollmer doing scientific crime detection. The better known one was Edward O. Heinrich, so-called "Wizard of Berkeley." He too began work in the field around 1910. By the time of the 1921 PSM article, he had his own crime lab that was anything but "pseudo" or rudimentary.

* * *

The less well known criminologist was Luke S. May, which is where I come in. I am currently finishing up the manuscript of a biography of May, who was a contemporary of Vollmer and Heinrich. He too went into business around 1910 as a private detective. By 1915, at the latest, he had assembled a well-equipped crime lab. He began in Salt Lake City but was based in Seattle after 1919. By 1921, when the PSM article came out, May had used and made pioneering advances in many techniques. He had solved scores of crimes using: systematic crime scene investigation, tool mark identification, audiograph surveillance, blood analysis, blood spatter analysis, bullet trajectory determination, handwriting evaluation, firearms identification, detection of poisoning, what we now call "profiling" and more. He might use specialists for blood chemistry and poison identification, but knew the strengths and weaknesses of all the methods those specialists used. Thus, he (like Heinrich) was a generalist and could, and did, offer expert court testimony about many kinds of evidence.

* * *

It's a shame that no one has done a definitive history of criminalistics in the United States. In many specialties, the U. S. had overtaken and even surpassed Europe by around 1930. That included questioned documents examination (Albert S. Osborn was considered the best handwriting expert in the world) and firearms assessment (Colonel Calvin Goddard). Luke May was himself viewed in Europe as one of the top scientific detectives in the world.

—Evan Filby

See:
www.historylink.org/index.cfm?DisplayPage=output.cfm&file_id=4241

The Current State of Forensics: A "Newbies" Perspective

Ever since I was 12 years old it was my dream to be a forensic scientist. Like many others, my initial interest stemmed from the show "*CSI*" (the Las Vegas one). I would run to the TV every time I heard *The Who's* "Who Are You" opening theme and would watch as Grissom, Warrick and the rest of the original gang would dust for prints, look through microscopes and use alternate light sources (without any googles I might add) to help solve crimes, using science! I was hooked. As a kid I always liked mysteries (shout out to the Boxcar Children) and had an aptitude for science. Throughout high school I did fairly well in my science classes and my interest in forensics intensified. I chose California State University, at Los Angeles to start my forensic journey which had just built the Hertzberg-Davis Forensic Science Center which housed the Los Angeles Police Departments' Criminalistics Laboratory (probably one of the largest in the United States), Los Angeles County Sherriff's Scientific Services Bureau, The California Criminalistics Institute and the California State University Los Angeles School of Criminal Justice and Criminalistics. For a kid growing up in Los Angeles, wanting to do forensics, there was not a better place to go to school.

After years of hard work, schooling and interning (at LAPD, unsurprisingly) I was able to get hired at an U.S accredited State Crime Lab. Ecstatic to have finally been hired after a few rejections, and eager to learn everything I could about the field of forensic science. My research led me to a number of articles attacking the very field I was most passionate about. These articles would say things like there's "a disaster going on in today's crime labs" and "can we trust crime forensics?" My initial reaction was defensive. But I then re-read the articles and took another look at the National Science and Technology Councils report on strengthening the forensic sciences and began to realize that there is SOME merit to what is being said.

Now that I've been in the field for about a year and a half as of writing this article, I can say confidently that from my "newbies" perspective, there are some issues that need to be addressed if the field is to advance and improve; something I would like to help accomplish. A lot of U.S crime labs are understaffed and underfunded which leads to attrition. They are in a constant circle of never being able to stay above water. One step forward, two steps back so to speak. Also, in agreement with Dr. Max Houck's assessment on another growing issue in the field, there seems to be an asymmetric power balance when it comes to law enforcement agencies, the prosecution and the forensic service providers who serve them; the forensic service providers being the ones at the bottom of the totem pole. When something goes awry (especially on a high profile case) it's, more often than not "the lab's fault". (Refer to https://www.mcdb.ucla.edu/Research/Goldberg/HC70A_W10/pdf/CSIReality.pdf for more information on the topic.)

I don't know how to fix all of the issues, and at this point in my career how could I? I'm just making observations. What I do know is that to fix any issue there needs to be a dialogue started and "uncomfortable" conversations to be had. Because at the end of the day, politics and pay issues aside, we do what we do because something unfortunate happened to someone. They deserve the best, and I want to give it to them.

—Dante Webb

Much Ado About Nothing

In the December 22, 2015 issue of the online version of *Forensic Magazine* is an article written by the Editor, Sean Allocca. Even the article's title is in muckraking style, "New Forensic Analysis Shoots Holes in the JFK Assassination Report." As the Bard of Avon might say, this new forensic analysis is *Much Ado About Nothing.*

In his very first sentence this *Editor* makes a mistake. It begins: "In 1979, *FBI expert* [emphasis added] Dr. Vincent Guinn analyzed five bullet fragments found after the JFK assassination to determine if the fragments came from more than two bullets." A memorial to Vincent P. Guinn may be found at: public.wsu.edu/~rfilby/Vince_Guinn_Memorial.pdf

It states: "From 1961-70, he was the Technical Director of the Activation Analysis Program at General Atomic in San Diego, CA, which initiated his innovative career in the field of neutron activation analysis (NAA). He continued his fruitful research in this area while a Professor of Chemistry at the University of California, Irvine from 1970-88" —no mention of any connection with the FBI in 1979. And further down he confuses "Four chemicals" with elements (antimony, copper, arsenic, and silver).

This "New Forensic Analysis" is put into proper perspective at the blogspot:

Dr. Vincent P. Guinn and Neutron Activation Analysis
A brief evaluation of the bullet-fragment evidence, the NAA tests done by Dr. Guinn, and subsequent NAA studies
jfk-archives.blogspot.com/2010/06/vincent-guinn-and-naa.html

However, from a Google search for Vincent Guinn I found out that in 1979 he had also testified in the Capt. Jeffrey MacDonald murder trial (for those too young or senile to remember this case, see the book, *Fatal Vision* by Joe McGinnis). From the voir dire part of the transcript of Guinn's testimony, I learnt that Guinn had been a member of the CAC:

1979 Jeffrey Macdonald Case Trial Transcript
August 13: Dr. Vincent P. Guinn
www.thejeffreymacdonaldcase.com/html/tt-1979aug13-guinn.html#top

Q: Dr. Guinn, are you a member of any honorary societies or professional societies?

A: Yes. Many of them common to this field—the American Chemical Society, of course. I am a fellow of the American Nuclear Society. In the forensic field, I am a fellow of the American Academy of Forensic Sciences, and a member of the California Association of Criminalists, and member of the Forensic Society of England.

I highly recommend you read Dr. Guinn's part of the trial transcripts in the Jeffery MacDonald trial. It should become obvious that he was a meticulous scientist and not given to hyperbole in his testimony. In short, we can be proud that Dr. Vincent P. Guinn was a member of the California Association of Criminalists.

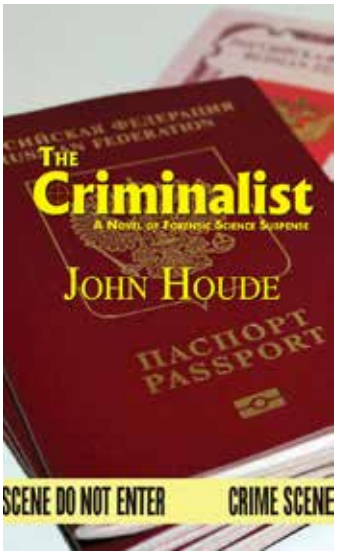
—Bob Blackledge

Books

The Criminalist
by John Houde

Review by Greg Matheson

Writing is a fundamental skill required for being a forensic scientist. We all write case notes, we all write analytical reports, some of us write research papers, some of us write editorials and journal articles, some of us write single chapters and a few of us write whole technical books and textbooks. In addition, I would bet that many of us think our experiences as forensic scientists can be captured in creative ways by producing fiction books that will be very entertaining and ultimately lucrative. However, there have been few forensic scientists who have successfully transitioned from strictly technical writing to producing interesting and entertaining fiction books.



In 1999, the CAC's very own John Houde (the real brains and creative genius behind our much-acclaimed *CAC-News*), completed and published a book titled CRIME LAB: A Guide for Nonscientists. I am the proud owner of two copies, with my most cherished being the one signed by John. CRIME LAB is a well-written and very easily understood primer on our profession. It is my understanding that John's book is popular among lawyers, educators, and forensic scientists. Though I have no idea if it has been fiscally successful, it very clearly shows John's skill as a technical/non-fiction writer.

A couple of seminars back, John shared with me that he was trying his hand at fiction, entertainment writing. I was a bit envious because buried deep in the back of my mind is the desire to write fiction myself. I, like I'm sure many of us, think we can be the next Patricia Cornwell, entertaining millions while raking in millions. Though slightly envious, I was also very impressed that John was actually embracing his dream and making it happen. I told him that I would love to purchase one of the first copies and would share my thoughts of his work with the CAC by writing a book review.

Much sooner than I had expected, John contacted me to say his book was finished, he was shopping for a publisher, and asked if the offer was still open to review his first fiction literary masterpiece. I jumped at the opportunity.

Like previously mentioned, John has already produced a technical book that was well-written and well received. However, I must admit, I have never read it from cover to cover, but I have read several selected parts and it has held up well. I am pleased to say, it was very easy to read John's fiction book, The Criminalist, cover to cover.

It is a unique experience reading a book written by someone you know. I found myself picturing John typing away on his computer while I was reading his words. I found myself wondering which of the events his characters experienced he had personally experienced and which were total fiction. Knowing the author added another level to the reading experience.

My initial reaction to the book, as I started reading, was one of concern. I wanted it to be great, but I found it to be a little confusing. However, I quickly discovered that my confusion was actually background for plot twists and turns that were well-developed and became clear as I read on. Once I discovered this, I started reading it as I would any other book, letting myself get involved in the story and very much enjoying the ride.

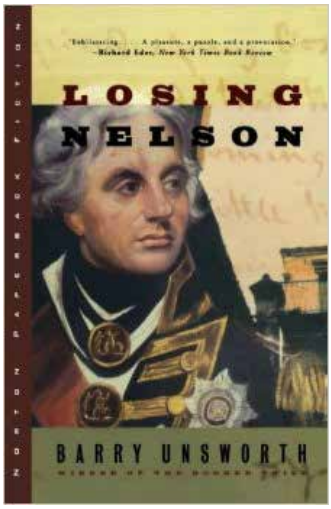
As I got to know the many characters in The Criminalist, I found myself connecting them to people I have known in crime labs, police departments and other parts of the criminal justice system. I'm sure the real people I associated with a character had nothing to do with the character in the book, but he did a good job of capturing the essence of many people I have known and associated with during my career.

If the writer of fiction is a technical expert of a field, it becomes too easy to over emphasize their unique knowledge and potentially turn off the reader with too much detail or esoteric lingo. I feel John did a great job of balancing the use of his technical knowledge. His own experiences and his knowledge of forensic science and law enforcement are apparent through his characters, but he doesn't take it too far. I am sure forensic science novices and experts alike will enjoy the touch of technical material.

I am pleased to say that John wrote a good and entertaining piece of fiction. I admit, it took a little bit of time for me to settle in and get a grasp of the story, but when I did, I enjoyed the experience and looked forward to my next opportunity to pick up where I left off and follow the characters through their experiences. I highly recommend purchasing a copy of John's first fiction effort when it becomes available and enjoy sharing the experience of one of our colleagues branching out into new territory. I wish him success in his new venture.

Losing Nelson
by Barry Unsworth

Review by Raymond Davis



I'm recommending another novel I discovered at my local library's book sales. I drop by two or three times a month spending about $10 for $140 worth of books. Yes, I have an eBook but I'm still an analog kind of guy—I just like the feel of turning pages, putting comments in the margins and highlighting great dialogue. The novel is called, Losing Nelson. Not

please turn to page 26

Clear Adhesive Tape Analysis Using Polarizing Light Techniques: The "Megascope"

*by Brad Rogers**

Introduction

Polymer analysis often entails a complex and quite lengthy procedure. For example, clear adhesive tape contains at minimum the polymer backing and adhesive. Each of these layers may be analyzed by several techniques, including polarizing light microscopy (PLM), Fourier Transform Infrared Microscopy (FTIR) and perhaps pyrolysis with the aid of a Gas Chromatograph with a Mass Selective Detector. Instruments such as these are expensive and through lean budget periods, most organizations are forced to pass over laboratory instrumentation purchases. A simple and very economical method used to compare clear adhesive tape or other clear polymer sheets, such as plastic sandwich type baggies, is the Polarized Light Megascope. The 'megascope' utilizes principles established with fiber analysis and polarized light microscopy, simply on a larger scale.

Megascope Construction[1]

The megascope is comprised of a plate of frosted glass (for light dispersion) secured above a light source. It is important that the frosted glass be placed high enough to disperse the light completely without viewing the individual bulbs through the glass. Additionally, two large polarizers (polarizer and analyzer) are required for the megascope. Each is made by placing one sheet of 12" x 12" polarizing film (full wave) between two glass plates. To prevent injury, the plate edges may be covered with black electrical tape. The polarizer is placed on top of the frosted glass and the analyzer is elevated and rotated 90 degrees relative to the lower polarizer; film canisters were used to provide elevation for this setup (See Figure 2). Samples are then inserted between the polarizer and analyzer and rotated to observe differences.

Infrared Analysis

Fourier Transform Infrared (FTIR) analysis is a mainstay in forensic polymer analysis and provides more specific chemical information about polymer composition than optical microscopy [2]. For instance, the sub-generic classes of nylon 6 and nylon 6,6 may be distinguished with FTIR (Figure 3) whereas differentiation with other techniques, such as Polarized Light Microscopy, melting point and solubilities, are less discriminating.

In this study, FTIR analysis was performed on several pieces of tape collected from different sections within the author's laboratory. All tape samples collected were from standard rolls of two inch 3M 3750 tape. Figures 4 & 5, showing the FTIR spectra of adhesive and polymer backing are virtually indistinguishable.

*Oklahoma State Bureau of Investigation.
This article was originally printed in the July 2003 issue of the International Association for Microanalysis newsletter. It is reprinted here by author's permission.

Although infrared analysis is chemically specific, the optical characteristics obtained through the use of polarized light are invaluable. As stated by Palenik [3], there are four basic optical properties (refractive index, isotropic refractive index, birefringence and sign of elongation) that can be determined for any fiber. In effect, these sections of tape are analyzed with the Polarized Light Megascope like fibers are analyzed with the Polarized Light Microscope.

Megascope Analysis

The megascope has a practical association to polarized light microscopy of fibers, but on a macroscopic scale. The Polarized Light Microscope (PLM) is used to determine the generic class of synthetic fibers through observations of interference colors and the calculation of birefringence. The interference colors are seen when comparing clear adhesive tapes with the megascope as well.

Interference colors differ widely on some pieces of tape (Figure 1), while they are similar in other pieces of tape. The interference colors of the different tapes may yield important information, but of equal if not more importance is the extinction point/angle. Plane polarized light is said to vibrate parallel to one particular direction [4]. If the tape is oriented so that one of its principle refractive indices is parallel to the vibrational direction of the polarizer, then all emerging light is absorbed by the analyzer, which is rotated 90 degrees to the polarizer [5], thus producing a black image (the extinction point). Extinction points of fibers, for instance, coincide with the length of the fiber, whereas extinction points of clear tapes do not necessarily coincide with the length of the tape. This extinction point is observed using the megascope. The angle between the extinction point and the length of the tape may be measured. By viewing the tapes side-by-side and comparing the extinction points, real differences may be viewed in the tape analysis.

Fiber birefringence may be calculated by plotting the interference color and fiber thickness on a Michel-Levy chart. Minor diameter variations in two fibers can result in excluding one sample from a known source of fibers. Variations in thickness of the fiber will result in slight variations of the interference color. Some thickness variation can also be observed on a single strip of tape, with a corresponding change in interference color. However, minor thickness variations in tape analysis may not be as crucial, as noted above, as differing extinction angles.

One question then, is do thickness variations in tape alter extinction angles? In Figure 6A, five strips of tape (taken from the same roll, collected at ten feet intervals) were layered in the same direction. The extinction point of all five pieces coincide at the same position. Figure 6B shows an induced difference of extinction. Three pieces of tape were placed on top of each other at differing angles. Extinction of all three pieces is never observed at any rotation.

Sequencing of plastic bags is also possible. Great differences may occur between bag manufacturers, while within the same box of sandwich bags, the order of bags as they were cut from the roller may be observed by comparing manufacturing marks (Figure 7) [6].

Conclusion

Fiber and clear adhesive tape analysis share similar methods of forensic analysis. Polarized light techniques are used to identify and/or characterize the polymer in both situations. Whereas with fiber analysis, the birefringence is

sought for identification and the extinction point may be less interesting, observation of the extinction angle with a megascope is very interesting. These observations form a direct relationship to the manufacturing marks [7]. Megascope analysis is inexpensive yet the resulting discrimination, is in some cases, superb when compared to more expensive equipment. The comparison of spectra in Figures 4 & 5 shows little difference, but by using the megascope, the two tapes are easily differentiated (Tapes A & B, Figure 1). This technique is simple and enlightening yet sensitive and very meaningful!

Acknowledgement

Mel Hett, formerly of the Oklahoma State Bureau of Investigation, is one of the initial developers of the "megascope". Mel's knowledge and expertise in trace analysis is sincerely missed.

References

1. Hett, M.R., A Case Involving Comparison of Plasctic Trash Bags, Presented at Southwestern Association of Forensic Scientists Meeting, Spring 1980.
2. Tungol, M.W., Bartick, E.G., Montaser, A., Forensic Examination of Synthetic Textile Fibers by Microscopic Infrared Spectrometry, In: Practical Guide to Infrared Microspectroscopy. Humecki, H.J. editor. 1995. 245-285.
3. Palenik, S.J., Microscopical Examination of Fibers, In: Forensic Examination of Fibers. Robertson. J., Grieve, M. editors. 1999. 153-177.
4. Bloss, F.D., Optical Crystallography, Mineralogical Society of America. 1999.
5. McCrone, W.C., McCrone, L.B., Delly, J.G., Polarized light Microscopy, McCrone Research Institute. 1984.
6. von Bremen, U.G., Blunt, L,K.R. Physical Comparison of Plastic Garbage Bags and Sandwich Bags, *J. For. Sci.*, JFSCA, V28, No. 3 July 1983, 644-654.
7. Smith, Jenny. PLM Examinations of Clear Packing Tape and Determination of Monoaxial or Biaxial Orientation. ITER/MICRO-2002 Abstract. *The Microscope* (2002) 50.

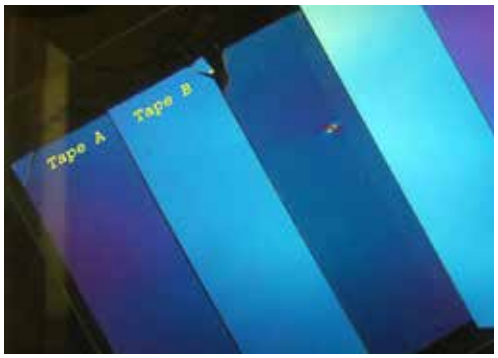


Figure 1. Interference colors of five (5) pieces of Scotch 3M 3750 tape collected from five different units within the author's laboratory.

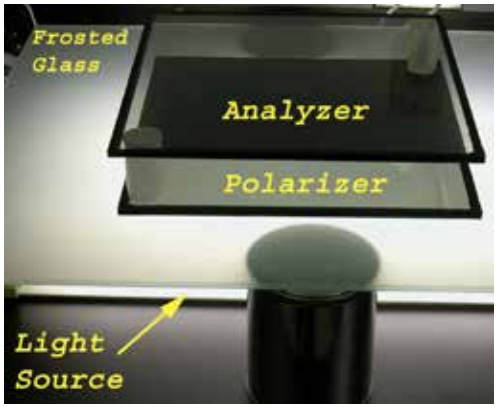


Figure 2. Megascope Setup

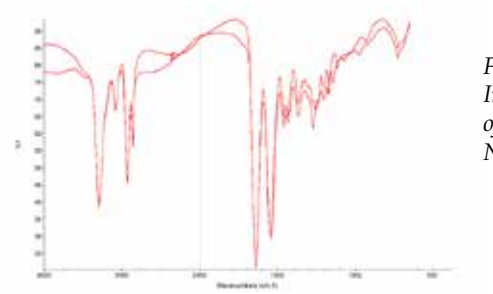


Figure 3. Infrared spectra of Nylon 6 and Nylon 6,6.

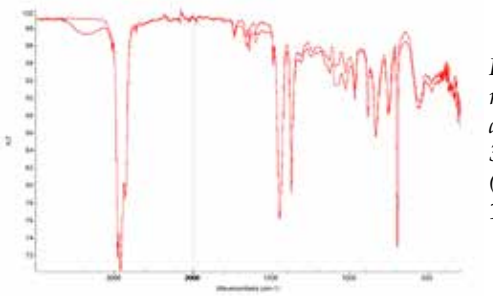


Figure 4. Infrared spectra of adhesive from 3M 3750 tape (Figure 1A & 1B).

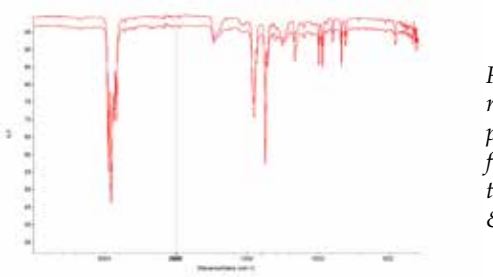


Figure 5. Infrared spectra of polymer backing from 3M 3750 tape (Figure 1A & 1B).

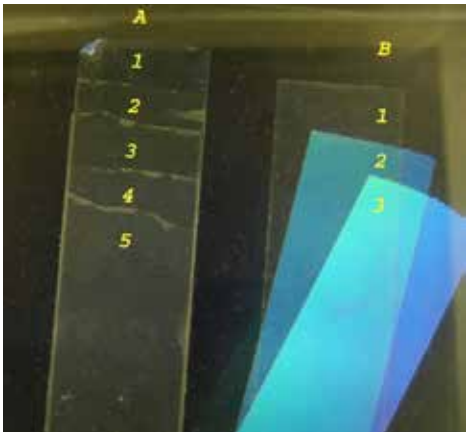


Figure 6. Comparison of thickness and extinction.

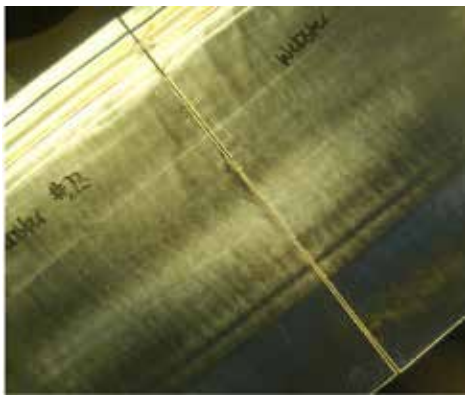


Figure 7. Sequencing marks observed in plastic sandwich type baggie comparison.

NIST Shows Crystal Pattern Mapping Can Recover Obliterated Serial Numbers in Metals

R.M. White and R.R. Keller

Researchers at the National Institute of Standards and Technology (NIST) have demonstrated a technique for mapping deformation in metals that can recover destroyed serial numbers on metal objects such as firearms, a common challenge in forensics.

Firearm comoposite

For an experiment to recover serial numbers that have been destroyed, NIST researchers hand-stamped X imprints into stainless steel (first image) to simulate a firearm serial number. Then they polished away the imprints (second image, scale bar in millimeters). Researchers recovered the imprints (third image) by combining pattern quality maps, calculated by software, which reveal crystal damage and deformation in the steel.

The technique might also meet other forensic needs such as reconstructing vehicle identification numbers or imprints on ammunition casings, the researchers suggest.

Law enforcement agencies use serial numbers to track ownership of firearms and build criminal cases. But serial numbers can be removed by scratching, grinding or other methods. Analysts typically try to restore the numbers with acid or electrolytic etching or polishing, because deformed areas behave differently from undamaged material. But these methods don't always work.

As a possible alternative, NIST researchers used a technique called electron backscatter diffraction (EBSD) to read, in the crystal structure pattern, imprints on steel that had been removed by polishing. In EBSD, a scanning electron microscope scans a beam of electrons over the surface of a crystalline material such as a metal. The electrons strike atoms in the target and bounce back. Because the atoms are arranged in a regular pattern, the scattered electrons interact and form patterns that reveal the crystal's structure on a scale down to tens of nanometers. The more perfect the crystal structure, the stronger and clearer the pattern. Software can then calculate the pattern quality to reveal crystal damage; areas with more damage produce lower quality patterns.

In the NIST experiments, described in *Forensic Science International*, researchers hammered the letter "X" into a polished stainless steel plate. The letter stamps were as deep as 140 micrometers, meeting federal regulations for firearm serial numbers. The researchers then polished the metal again to remove all visible traces of the letters, and collected the EBSD diffraction patterns and pattern quality data and analyzed them for evidence of the imprints.

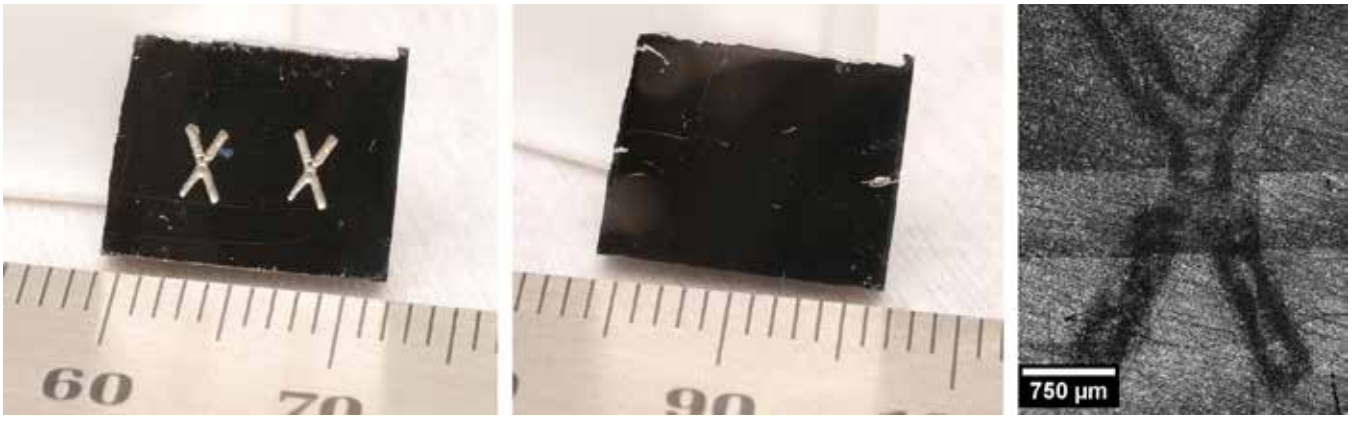
Ordinary SEM imaging methods revealed very faint outlines of the X stamps in the metal grains. However, pattern quality mapping more clearly revealed the outlines of the Xs, and according to the team, would probably be acceptable for submission as forensic evidence. The latter technique is significantly more sensitive to small amounts of crystal lattice damage.

The technique is still experimental, but shows some promise. The NIST team found evidence of metal deformation down to about 760 micrometers below the surface, much deeper than the actual X stamps. Even so, the researchers say it's not clear whether EBSD pattern quality mapping is more sensitive and/or more effective than conventional techniques for reconstructing serial numbers, or whether EBSD will work in cases of the most extreme destruction. Experimental comparison of the new technique to traditional techniques is under way.

Currently, the NIST method is time-consuming: A technician would need three full days to reconstruct an 8-character number. With further development and optimization, such as making pixel sizes larger in the images, recovery time probably could be reduced to about an hour, according to the researchers. The researchers suggest that wide adoption of this technology might enable manufacturers to place "hidden" sub-surface serial numbers on firearms—numbers that would be invisible to criminals but clearly detectable by law enforcement with this new analysis method.

The idea of using EBSD to recover firearm serial numbers was first proposed at a conference several years ago by Carl Necker of Los Alamos National Laboratory.

For an experiment to recover serial numbers that have been destroyed, NIST researchers hand-stamped X imprints into stainless steel (first image) to simulate a firearm serial number. Then they polished away the imprints (second image, scale bar in millimeters). Researchers recovered the imprints (third image) by combining pattern quality maps, calculated by software, which reveal crystal damage and deformation in the steel.



Credit: White/NIST

The Kirk Transcripts:
Gleaning Some Useful Tips

by Raymond Davis

Dr. Kirk's contributions to the field of forensic science are well documented and his two important texts; *Crime Investigation*, edited by John I. Thornton and *Fire Investigation*, edited by John D. DeHaan, should be in close proximity to every criminalist's desk. Dr. Kirk was a professor at U.C. Berkeley, past president of the CAC, member of numerous scientific organizations and author of hundreds of technical papers placing him in the vanguard of forensic science.

His testimony in the *Sam Sheppard* case was reprinted in the *CACNews* [1st Q 2016] and provides an opportunity for me to highlight ways in which to improve one's courtroom skills. Expert witnesses need to be as vigilant on the witness stand as they are in the laboratory. It is my intent here to highlight some of the things that I have encountered over the past twenty five years which can have an impact on one's credibility in the courtroom. If you see something I've missed, let me know.

Page 1057. (*CACNews cover image*)
Q. Sir, will you state your name?
A. Paul L. Kirk, K-i-r-k.

Dr. Kirk was not asked to spell his last name. I see this quite often in my classes where the expert witness spells their full name even when not asked to do so. Listen to the question!

Q. Doctor, where do you live?

He gives his home address which I advise not to provide if you're asked. My position has been to state your business where you can be reached 24/7. Since attorneys mean to ask for your business address, I don't have a problem with 'misunderstanding' the question. BTW, I don't understand why his attorney asked for his home address.

Q. And how long have you held your teaching position?

Dr. Kirk gave a long rambling answer about the various schools he taught at and his various titles throughout his illustrious career. The question called for a specific answer, such as "15 years."

Page 1058. **Q. Doctor, would you give us a résumé of your educational background other than that which you just described?**

Dr. Kirk's answer would have been appropriate had he been asked, "Would you provide us with your educational background or C.V." Many experts fail to distinguish between the two words: Rêsumé and CV. The resume is about your work experience and the CV more about your education. When I've been asked this question, I'll begin by answering, 'I received my bachelor's degree . . .' Not the places I worked at.

Page 1059. The first sentence in Dr. Kirk's response at the top of page 1059 was all that was required of him. The remaining portion of that answer was not necessary to properly respond to the question. Most witnesses are admonished not to provide answers beyond the question posed. Also, Dr. Kirk used the phrase; 'of course' in his answer which implies that the listener should already know the answer. Don't say, 'of course', 'as you know', 'as I said', 'actually', etc. They are filler words that rob the expert of their credibility.

Q. Have you been involved in legal cases prior to this one?

Dr. Kirk's answer is non-responsive. He should have simply answered, "Yes." He wasn't asked how many cases he'd been involved in or where.

Last answer on this page, he uses the phrase, 'of course' again.

Page 1060. Half way down the page; Dr. Kirk uses the phrase, 'of course', again. Purge these words and phrases from your vocabulary.

Page 1061. Dr. Kirk was asked to provide more information about his background and he states, **"I am trying to think of all of them. Associations..."** He obviously didn't have his CV with him. And, it looks like counsel didn't have a copy either; otherwise he would have offered his copy to assist him.

Half way down this page, he says, 'actually'. When people use this word, they think the listener might be skeptical. It's like saying, 'really' or, 'trust me.'

At the bottom of this page, a question is asked, **"Tell us the jurisdictions in which you have testified?"**

Dr. Kirk answers, **"I have testified in New York, New Jersey, ... "**

A jurisdiction is a legal authority, such as, 'Federal District Court – San Francisco', or, 'Los Angeles Superior Court' and not the state in which you testify.

Page 1062. Read the first sentence of the first paragraph. **"I have investigated in addition in some additional places."** *(My emphasis.)*

What? His response doesn't make any sense. But, that's not unusual as I've heard many similar comments from experts in my courtroom classes. When asked why they responded as they did, their comment is, "I didn't say that." And the rest of the class says, "Yes, you did." I have found it disconcerting that people do not listen to the words coming out of their mouths. The rest of Dr. Kirk's answer is non-responsive and I'm surprised that opposing counsel didn't object.

At the bottom of the page, Dr. Kirk is asked,

Q. "When did you first meet her?"

A. "I am not quite sure. I met her several years ago and I have know (sic) her quite well in recent times." *(My emphasis.)*

What does that mean that he knew her, 'quite well'? I wonder if anyone blushed when he said this. By the way, do you know who they are they talking about? Neither do I. It's the witness's responsibility to mention the name if the attorney hasn't mentioned it to avoid the problem later when reviewing the transcript.

Kirk, *cont'd*

Page 1063. *Dr. Kirk's answer at the bottom of the page.* **"Well, <u>of course</u>, I saw the two Sheppard brothers, Richard and Stephen. I saw their families, <u>of course</u>, as well."** *(My emphasis.) Two, 'of course', in one sentence!*

I have had too many professors explaining complicated scientific concepts finishing by stating, "Of course this makes perfect sense."

The phrase, 'of course', implies understanding or fore knowledge. Don't assume that your audience knows anything.

Page 1064. *The second sentence of Dr. Kirk's answer is non-responsive. Mentioning that someone is now a judge is extraneous and unnecessary. Please remember to listen to the question and only respond to that question. Commentary is not appreciated and you may get rebuked by opposing counsel, worse, by the judge.*

Page 1065. *Second answer. Dr. Kirk used the phrase,* **"In those days means for doing so were very <u>primitive</u> as compared to the present."** *(My emphasis.)*

I would caution using such a negative term. Perhaps a better way to state this would have been, "The means for doing so was not as advanced as it is at the present." Even if a test or analyses is no longer employed or approved, it was at one time, 'State of the Art.' Remember, we are in control of our answers and stating things in the best, most accurate light possible is important to the trier of fact. It's not spin. But simply stating things accurately.

You may have noticed that there wasn't a single non-word (um, ah, er.) uttered by Dr. Kirk throughout the nine pages. Or, that the court reporter decided not to publish these sounds of hesitation. Either way, it always reads better when people speak without speaking these irritating sounds.

Reading this portion of Dr. Kirk's testimony reminded me how I felt when I read my transcripts early in my career. I was appalled by how poorly I spoke thinking I had dazzled everyone in the courtroom. It's humbling to read what one says captured for eternity for all to criticize. More effort needs to be taken to speak well and that requires practice and getting feedback. Don't wait to go to court to practice. It is for that one purpose alone that I write this article. Dr. Kirk's testimony in the *Sam Shephard* case is an object lesson for us all. The advancement of our profession is built upon the experiences of others.

Raymond Davis has been teaching courses on effective testimony through CourtSkills for twenty-five years.

Read All

About it.

www.cacnews.org

LA Confidential: A Crime to Remember

Los Angeles Police Department
Forensic Science Division

2016 Spring Seminar
May 2-6th, 2016

The Garland Hotel
4222 Vineland Ave
North Hollywood, CA 91602
Room rates $155/ night
(+taxes/ fees, based on availability)

http://www.cacnews.org for more details

Candidates for the CAC Board of Directors

For President-Elect

Vincent Villena

As the first student to graduate in the forensic science program with a chemistry background in 2006 at San Jose State University, I have had the pleasure to intern at the current CAC president's laboratory at the Santa Clara County Crime Lab. I was also mentored by a former CAC President, Lisa Brewer. (Verdugo Regional Crime Laboratory). I then started my forensics career at the Kern County Crime Lab assigned in the Toxicology unit, and further expanded my knowledge in the field at the Scottsdale PD Crime Lab in AZ where it provided me with countless testimony hours in over a hundred cases. I recently started and am currently enjoying my position at the Henderson PD Crime Lab in NV.

I have been a member of the CAC since 2008 and have served as the Awards Committee Chair since then. I have attended a number of CAC Seminars which has always provided me not just with information in my field, but also well-roundedness in the other facets of forensic science. Not to mention that it is the best way to network with other members of the forensic community. I am also a member of the California Association of Toxicologists (CAT) and the American Academy of Forensic Sciences (AAFS). After receiving my Master's Degree in 2011 and, more recently, obtaining my certification from the American Board of Forensic Toxicologists (ABFT), it seems to be the appropriate time to take on more responsibilities in the community. As president, I would reach out to newer, younger forensic scientists who will be paving way to the next generation of criminalistics.

For Regional Director-North

Cindy Anzalone

I am excited to run for the office of CAC Regional Director - North. I began this adventure into forensic science in 1997 when I opened up the yellow pages and called all the Bay Area Crime Laboratories and Coroner's Offices asking if they were taking any interns. At different points in time, I was fortunate to volunteer with the San Mateo County Coroner, the San Mateo County Sheriff's Office Forensic Laboratory, and the San Diego Police Department Crime Laboratory. After earning my degree in biochemistry and cell biology from the University of California in San Diego, the San Mateo County Sheriff's Office hired me as a Criminalist in the Controlled Substances and Toxicology sections. I have been here ever since and am currently assigned to DNA/Forensic Biology as well as Crime Scene Investigation.

I have been a CAC member since 1999 and previously served as assistant treasurer from 2002 - 2008. I have attended numerous CAC seminars and study groups and have always enjoyed the professionalism, comradery, and sense of purpose as to why our organization exists. I would like the opportunity to help plan study groups and seminars, to represent the CAC members in northern California, and to serve as your CAC Regional Director - North.

For Membership Secretary

Megan Caulder

It is an honor to be nominated for the CAC board position of Membership Secretary. I first joined the CAC in 2005 as a student affiliate member while working on my Forensic Science Master's degree at the University of California, Davis. In 2009 I started working at the CA Department of Justice Jan Bashinski DNA Laboratory as a criminalist in the Databank unit. I had the opportunity to do work with the CODIS and familial searching programs, and in 2014 I transitioned to the Biology unit. In 2011 I became a full CAC member and in 2013 I began serving as the Northern DNA Study Group Chairperson. Since early 2013 I have organized seven meetings of the DNA study group. The chairperson position has been a great opportunity to facilitate communication amongst my colleagues about current forensic technologies, issues, and cases. I have continued to pursue my passion in the forensic field by attending several CAC seminars, and I was recently certified by the American Board of Criminalistics. I would like to continue to be involved in the forensic community and I am certain holding a position on the CAC board would be a valuable and rewarding experience. Thank you for your consideration for the position of Membership Secretary.

For Recording Secretary

Gunther Scharnhorst

I am a criminalist working for the California Department of Justice at the Jan Bashinski DNA Laboratory in Richmond. I joined the CAC as a forensic science graduate student at UC Davis in 2008 and began working for the DOJ shortly thereafter. I began serving the Bureau of Forensic Services in the Data Bank unit and worked there until 2013 when I moved into my current position in the Method Development unit. I also hold a certification in Molecular Biology by the American Board of Criminalistics.

I have been involved in attending CAC seminars and study groups since first becoming a member and really enjoy the wonderful people and presentations at every event. I also had the pleasure of presenting at the fall 2015 seminar; the first of what I hope will be many opportunities to address the membership.

It is an honor to be nominated for the position of Recording Secretary where I expect to continue to broaden my knowledge of the CAC, its talented members, and our profession. I will do my utmost to serve the CAC as a member of the Board of Directors and would greatly appreciate your support. Thank you.

workshops workshops workshops workshops

Spring CAC Meeting

workshops workshops workshops workshops

Arson Investigation: Fire Scene and Collection of DNA and Trace Evidence

(2 Days, May 2-3)

Collin Yamauchi, John DeHaan, Frank Oglesby, Dave Liske, Eric Wahoske, Harry Garvin, Sean Carney

This workshop is designed to examine the collection, preservation and processing of fire evidence from the perspective of the fire debris chemist and the perspective of the fire scene investigator. Criminalists (fire debris chemists and DNA analysts), others assigned to the investigation of crime scenes (fire investigators) and crime scene investigators (CSI field criminalists and technicians) would benefit from this training.

CODIS

(Half-day, Monday)

Alexa Calderaro

This workshop will be an informal roundtable discussion led by the LAPD CODIS.

DNA: DTL and R&D

(Half-day, Monday)

Supria Rosner, Guest Presenters

This workshop will be an informal roundtable discussion led by the LAPD DNA Technical Lead, including topics such as validation of probabilistic genotyping software, expanded loci kits and other trending DNA analysis techniques and instrumentation.

Crime Scene Investigation: Contraband Concealment Course – Hidden Compartments

(All day, Monday)

Nick Ramos

This full-day workshop was developed to assist field investigators with the search of objects and property. This course teaches the investigator how to focus on learning the multitude of concealment methods and the indicators that lead to them. It also provides insight into how contraband and culture directs concealment.

Training during this course will cover: Learning common, naturally hidden compartments • Identifying indicators of mechanically installed traps "Clavos" • Articulating concealment indicators • Understanding how suspects beat the traditional search techniques • Learning how culture and contraband directs concealment • Discussing "in depth" concealment of vehicle and home

DNA

(All day, Tuesday)

This full day workshop will cover new and emerging trends in DNA analysis and discussions of case examples encountered by DNA analysts.

The Illicit World of the Drug Addict and What's Trending–What's Pending

(Half-day, Tuesday)

Peter Tulagan

This half-day workshop will enter into the illicit world of the drug addict. Participants will learn signs of use, symptoms of influence, street slang and the "tools of the trade".

This workshop includes an interactive portion where workshop attendees will gain a deeper understanding of drug use through hands-on exercises manipulating actual drug paraphernalia.

Additionally, this course will take a brief look at the evolution of illicit drugs including what's trending and what's pending. New drugs have been created that are more potent, harder to detect and easier to obtain. Attendees will gain valuable information in the identification, street level investigation and safety when encountering these substances.

Root Cause Analysis

(All day, Tuesday)

Josh Spatola, Emma Dutton

All organizations, regardless of size or mission are prone to problems, nonconforming work and departures from policies and procedures. Forensic science laboratories are no exception. The forensic science community, however, must be ever so diligent in actively identifying, understanding and correcting such non-conformances due to the impact that the quality of the work has on the criminal justice community. Root cause analysis is a process used to define, evaluate and systematically analyze a problem to determine the underlying reason(s) for the problem; the output of which is the input to corrective actions. Thus, it is essential for root cause analysis to be thorough for the corrective actions to be effective.

This workshop will provide participants with the basic knowledge and skills to perform root cause analysis and to effectively implement appropriate corrective actions to eliminate and prevent the problem from recurring. During this workshop, we will evaluate the corrective action process, define root cause analysis and discuss the philosophy and purpose of root cause analysis. We will outline the basic steps of root cause analysis and describe an effective approach for performing root cause analysis. We will learn the difference between correction vs. corrective action, the process of asking 'why' at least five times to determine the underlying reason(s) for the problem, and learn why 'blaming the individual' is missing the point.

Attendees will acquire skills and learn an approach for evaluating and improving the effectiveness of a management system through effective root cause analysis. In class exer-

please turn to page 26

OSAC, What's New?

by Robyn Weimer

As expected, there have been some developments within OSAC Subcommittees. At the first OSAC meeting in January 2015, each subcommittee began making task groups. Task groups allow the subcommittees to be working on several assignments simultaneously with small, focused groups. It is in these task groups that non-OSAC members, also called affiliates, can be included to assist in reaching goals. Keep reading for some updates, including progress from some task groups.

You may have seen there are now monthly "OSAC Newsletters" which include information about public comment periods, upcoming meetings, open vacancies, and accomplishments. For example, a new subcommittee chair is sought for Geological Materials. Visit *www.nist.gov/forensics* to sign up for NIST news, the OSAC newsletter, and to apply to become an affiliate.

Over 500 OSAC members braved the snow and gathered in Virginia for the recent January 2016 meeting. Subcommittee updates are planned for the AAFS meeting in Las Vegas in February. In the meantime, here are some notable accomplishments from that meeting:

Materials Trace

At the January 2015 meeting, seven task groups were formed, to include one group per subdiscipline within Materials (fibers, hair, paint, tape, and glass) plus an interpretation group and an outreach group. Since then, each subdiscipline group has been working on revising documents which are in various stages ranging from writing new training documents or updating/revising SWGMAT documents to resubmitting ASTM documents for votes. Excitingly, two glass documents (one on μXRF usage and the other on ICP-MS usage), having passed most steps in the process, and may to be added to the OSAC Registry very soon! Two paint documents (ASTM E1610 – standard paint guide & ASTM E2937 - IR of paint) are currently out for public comment period as well. The Materials (trace) subcommittee is also in the process of expanding! With hopes to expand, new members may be added to this group in the near future. So visit the site above to apply and keep an eye on the OSAC newsletter for the vacancy announcements.

The interpretation task group has made significant progress in drafting a document addressing how to interpret and describe the significance of the overall results of a comparative examination. The outreach task group is intended to identify the needs and perception of the TE community and determine opportunities to promote TE. This task group was responsible for the recent surveys distributed to lab managers and to trace evidence examiners. Much appreciation and thanks go out to the over 300 examiners who responded! Survey results will help this task group strategize how to best target education initiatives, promotion of trace evidence, research needs, and areas for improvement. They plan to compile the survey results into a *JASTEE* article later this year. Another survey is currently in revision for distribution to lawyers. The Outreach task group has concurrently been working on a field guide for Trace Evidence targeting crime scene personnel. As part of their initiatives, they also ask examiners to start gathering any adjudicated cases where trace evidence was critical to the case. They intend to compile these cases to help show the value of trace evidence and provide as a reference. If you have such a case, please forward the case information to Sandy Parent, *sandy.parent@dps.texas.gov*.

An eighth task group was created over the summer to determine research gaps within the Trace Evidence field. The group developed a list of research needs and will continue to do so. Of those ideas, two were put forth to the subcommittee at the latest meeting and approved for posting to the OSAC website. In time, more are expected to be added.

Fire Debris and Explosives

This committee aims to build on the strong foundation previously established through the efforts of SWG/TWGFEX. In January 2015, five major task groups were formed by this subcommittee: (1) to review/revise current fire debris documents; (2) to develop general guides for fire debris and explosives analysis; (3) to develop terminology documents for fire debris and explosives disciplines; (4) to develop a QA/QC guide for fire debris analysis; and (5) to evaluate needs and areas for development of research projects to further the fire debris and explosives disciplines. International participation has occurred through the inclusion of affiliates from Canada, the Netherlands, and England. Excitingly, having passed most steps in the process, one document on the extraction, derivatization, and GC-MS analysis of vegetable oils and fats may to be added to the OSAC Registry very soon! Currently, there are 18 documents in progress, including gathering resources for Daubert hearing preparations.

Gunshot Residue

One of the main topics discussed in this 2nd annual OSAC meeting was the, soon to be released, revised ASTM E1588 GSR by SEM/EDS standard which has been changed from an ASTM "Standard Guide" to a "Standard Practice". Once this document has been through the ASTM vetting process, it will then be sent through the OSAC approval process. The 2016 meeting was the first time international affiliates attended as guests. They provided valuable insight, as anticipated, and extended an invitation of joint collaboration with the ENFSI Firearms /GSR Committee. International participation is expected to grow with time but to-date the GSR Subcommittee has welcomed affiliates from law enforcement agencies in Australia, Israel, Canada, Finland, and Germany. Progress has been made on the proposed large scale GSR (organic and inorganic) population study headed by Dr. Suzanne Bell with West Virginia University. Work is still ongoing on documents which cover topics such as training, methodology, testimony, proficiency/competency, reporting and validation. Some of these documents are near completion and should be ready within the year for the next phase towards standard development. Two new task groups were created, one to deal with contamination concerns and the second to address the relevance/importance/obligations to our customers. The Report-writing task group sent their first survey to the Forensic SEM yahoo group, with plans for many more to be sent this year. All laboratories performing GSR analysis are strongly

cont'd on next page

OSAC *cont'd*

encouraged to participate in these surveys as the best standards arise from the input of all stakeholders in the field.

Geological Materials

This subcommittee is the smallest of the Trace related groups with a whopping 11 members. With spaces available, the Geological Materials subcommittee is interested in adding members in the coming year. If you currently perform forensic soil analysis or conduct research in this area, please consider applying to join and encouraging others to do the same.

Many of last year's initiatives (such as Terminology and Resources/References task group efforts) are large undertakings that will continue into 2016, some in coordination with other Subcommittees. As with other subcommittees, a research initiatives task group has been formed since the 2015 meeting. A number of research needs have since been identified with hopes that they will soon be posted on the OSAC website. In 2016, this subcommittee will focus on two significant areas. The first is conducting one or more workshops to test the currently drafted guide on the field collection of soil samples. ASTEE members will be notified once such a workshop has been scheduled. The second area of focus is the drafting of a new guide for the forensic examination of soil evidence. This will hopefully be the backbone upon which several soil analysis-related standards and guides are built.

Workshops, *cont'd*

cises will be used and numerous opportunities for discussion and Q&A are included.

Forensic specific examples will be provided. These examples will demonstrate how a thorough root cause analysis benefits the laboratory organization, the laboratory employees, and the laboratory customers by providing continual improvement opportunities.

Root cause analysis is a skill that must be learned, and a process that requires continuous improvement and resources. Too costly, some might say. Are you willing to accept the risk of not doing root cause analysis well?

Smith & Wesson Revolver Armorer's Course

(All day, Tuesday)

Mike Giusto

This full-day workshop will familiarize students with the design and functioning of common Smith & Wesson and similar revolvers. Disassembly, component identification, recognition of altered and defective parts, and proper reassembly are emphasized.

Each student will work on a S&W revolver using basic gunsmithing tools. During the class, students will be shown step-by-step how to detail strip the revolver, inspect the mechanism and parts, re-assemble the revolver, and perform function tests.

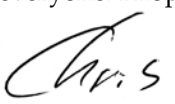
Losing Nelson, *cont'd*

only is it well-written, but also a unique read because of the author's ability to put the reader in the story by speaking in the first person. It can feel a little creepy at first, but you'll soon discover why he chose this writing style. Regardless, you have to read this novel. There are at least two forensic angles that will make it worth your time to read. First, the author uses a device for visualizing Nelson's greatest sea victories not unlike the skills employed by the crime scene reconstructionist and secondly, how the protagonist, through the author, avails himself of the voluminous information about Nelson, regardless of whether it helps his thesis or not. That's an important message when considering the task we have in managing the information available to us. Enjoy.

chris Coleman *cont'd*

who has won the lottery! (I actually haven't met one yet, but I imagine my reaction would be similar). I still believe it's the greatest profession around and I'm proud to be a part of it. Count yourselves special and lucky. We are the few who are privileged to work in this wonderful field.

And while we are lucky, I want to challenge all of you out there to step up. Present a paper. Contribute an article. Add to the body of knowledge. Join a committee. Run for office. It might be outside your comfort zone, but you will see how rewarding it is to be a vocal part of this association. You all have something to share, and sharing enriches all of us. Take care everyone. I hope to see you in LA in May.



CALIFORNIA ASSOCIATION OF CRIMINALISTS
BOARD OF DIRECTORS

Interested in becoming a member?

Visit us online at
www.cacnews.org

CAC QR Codes
Quick Response codes work with your smartphone to save time and typing. Point your phone's camera and visit the CAC!

CACNews.org Website

CAC Store


LA CONFIDENTIAL
A CRIME TO REMEMBER
CALIFORNIA ASSOCIATION OF CRIMINALISTS
FIAT JUSTITIA PER SCIENTIAM
CAC SPRING SEMINAR 2016
MAY 2ND • 6TH 2016 • THE GARLAND HOTEL • NORTH HOLLYWOOD • CA