

The CACNews

News of the California Association of Criminalists • First Quarter 2017



brooke
BARLOEWEN



CAC President

In May of 1962, Anthony Longhetti reported that the AAFS Methods Committee found that two of eighteen labs made false identifications on a bullet comparison exercise. This led to his suggestion that the CAC consider such studies and that criminalists use them to check the reliability of their own work. In other words, he was suggesting proficiency testing.

From the Archives to the Future

It is amazing what you can happen upon in your crime laboratory library when looking for a book. After finding some dusty, old CAC binders, I perused past meeting minutes, newsletters, and technical presentations from back as far as 1954. As a new year is upon us, I wanted to take a look back at the hot button topics from each decade in California since the beginning of the CAC. Here is a summary of what I found.

In the 1950's, the CAC Newsletter published a salary survey, which is still published today. A hot topic was the formation of the Code of Ethics, which is still in effect. However, in 1956 the CAC mandated that CAC members had to reside in California. This seems preposterous, as today the CAC accepts members from all over the United States. In 1955 the executive secretary was instructed to contact all members who failed to attend business or technical meetings and attempt to establish 100% participation by any means possible. I wonder what would happen if we tried that today?

In 1961, Paul Kirk spoke about requesting a Ph.D. program in criminalistics at University of California Berkeley and that training, ethics, and competency testing were essential to becoming a professional criminalist. More college programs and other training programs were needed, and there was an outreach effort to students in order to recruit new criminalists. The same year, the hot topic of publishing a CAC scientific journal was suggested. By 1965, the Journal of the Forensic Science Society became the official CAC journal. In May of 1962, Anthony Longhetti reported that the AAFS Methods Committee found that two of eighteen labs made false identifications on a bullet comparison exercise. This led to his suggestion that the CAC consider such studies and that criminalists use them to check the reliability of their own work. In other words, he was suggesting proficiency testing.

At the October 1970 Board Meeting, there was discussion about standardization in criminalistics and sending a board member to the national ASTM meeting, setting the stage for accreditation. At the October 1970 seminar, Alexander Shulgin suggested that criminalists would be dealing with phenethylamines and phencyclidine in the future.

The crack cocaine situation of the 1980's was a hot topic, and PCP showed up as predicted.

The 1990's brought us the hot topics of STR DNA analysis and the CODIS DNA database. At this point, DNA analysis really took off. There was also the IBIS/NIBIN database competing with the FBI's DRUGFIRE database in firearms. The IAFIS database for fingerprint comparison was automated. Criminalists began specializing in one discipline instead of being generalists. There was a massive push for labs to become accredited. The methamphetamine epidemic in California caused a lot of problems for many people including criminalists who had to process very dangerous clandestine methamphetamine laboratories. While televising the OJ Simpson case really brought forensic science into the limelight, it was tough on the criminalists who had to testify in what was essentially a television media circus.

CSI debuted on television in the 2000's. This was hot and made forensic science a popular job to have. Crime labs were inundated with applicants who wanted to be criminalists after seeing the show. But on the flip side,

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FIRST QUARTER 2017

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Diggin' It!

Meiling Robinson (l) and Melissa Dupee identify soil horizons at the Soil Recognition and Collection workshop. More photos of the fall 2016 seminar inside.

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

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CACBITS



Mary Gibbons Retirement

Chuck Morton and Carol Hunter (*l, middle*) celebrate the retirement of Oakland PD Laboratory Director Mary Gibbons. *Photo courtesy Jennifer Mihalovich.*



CAC Awards at the Banquet

CAC President Barloewen presented several CAC awards at the recent seminar in Ranch Mirage.

Mary Gibbons was voted Life Member by the CAC board of directors.

The Alfred A. Biasotti Most Outstanding Presentation Award from the Spring 2016 Seminar went to John Houde (*below left*) for his paper, "Having the Discussion."

The Best Poster Award from the Spring 2016 CAC Seminar went to Alexandra Chavez for her presentation of "Development of a Multiplex Assay for Simultaneous DNA Quantification and Body Fluid."

Greg Laskowski (*above left*) received the W. Jack Cadman Award.



Eučen Fu received a CAC

Service Award for his work on the Seminar Planning Committee.

Hiram Evans received a CAC Service Award for his work on the Bylaws Committee Chair Service Award

Chris Coleman received a CAC Service Award for his work on the board as immediate past president.



Civil Engagement Forum Offered

"Raising Awareness of Wrongful Convictions" is the topic of a free event sponsored by The California Forensic Science Institute, California State University, Los Angeles in association with the California Innocence Project, San Diego. Save the date! Friday, April 28, 2017 from 7:45a.m. - 2:00p.m. at the Golden Eagle Ballroom, Cal State LA, 5151 State University Drive, Los Angeles, CA. Continental breakfast and lunch will be provided. Please contact Katherine Roberts (krobert2@calstatela.edu) or Katharine Tellis (ktellis@calstatela.edu) for further information.

The Lengths a Criminalist Will Go

This photo of planet earth was shot by Paul Sham. He and Marianne Stam collected samples of sand from such exotic locations as the Cape of Good Hope and Namibia. Marianne says, "I walked down 278 wooden steps and 7 wooden platforms to get a sand sample from this beautiful, pristine beach! Going back up was a killer...but I made it!"



Alfenezza “Ness” Ferrer Palisoc (1980—2016)



I first met Ness when she was a new laboratory technician, eager to learn, and always smiling. She was ever cheerful, astute, and extremely helpful around the laboratory. Her diligence would eventually earn her the title criminalist and she joined the CAC to connect with and learn from others in the field. As she began working casework, screening evidence for biological fluids and preparing samples for DNA analysis, we developed a closer rapport as co-workers and casework partners. Often times she'd perform the screening on the DNA casework assigned to me. I remember performing the technical review on her case notes—she was always so meticulous, with impeccable penmanship. I enjoyed working with her and as our cases began to go to trial, our friendship grew. As we waited to testify in many uncomfortably cold courtroom hallways, we began bonding over conversations about Harry Potter, Kobe Bryant and the Lakers. She was easy to talk to which made our court trips enjoyable despite the traffic to and from LAX court or Compton court. I will never forget, what would turn out to be, our last court trip spent together. Ness, Shannan and I went to lunch together near LAX court. Ness mentioned to us that she had been experiencing acute stomach pains, on and off, for some time. We suggested that a routine trip to the doctor was in order, just to check things out. It wasn't too long after that afternoon that we learned of her diagnosis. This was when our friendship began to change. She became a fighter, and I, her wellness warrior. As she fought her battles in the hospital, I helped rally support around her. As scientists we started researching everything we could about sarcoma, and long visits at City of Hope became wellness-planning sessions. She always had a game plan, reinforcing my resolve to help support her in whatever way I could. I will always remember how we smiled and how we laughed during our visits. Through all of it, she lived her life as an example for all, each moment to the fullest, with grace and dignity, and she never stopped smiling. I can still hear her laughter and see her smile in my memory, and it lends me strength when I find myself missing her.

Ness passed peacefully, surrounded by her family on September 3, 2016. She is survived by her loving family—her parents Delia and Pio Palisoc, her brother Jeffrey Palisoc, and her husband Tommy Casingal.

—Meiling Robinson

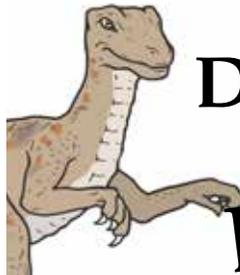


meiling
ROBINSON



CAC Editorial Secretary

Maybe it was the haziness brought on by the wine and the residual warmth emanating off the desert surroundings, but I was emboldened to ask them all why they felt disconnected from the younger criminalists...



Drinks *with* Dinosaurs

It was a superb warm November evening at the Omni Rancho Las Palmas Resort. Lights shimmered in the background upon the man made lake surrounding the fifth green. It was the night of the new member reception. I found myself at the Sunrise Terrace, wine glass in hand, talking to the current President Brooke Barloewen and the Immediate Past President Chris Coleman about how we could return the focus of the wine and cheese reception back to the new members. In recent seminars it seems that fewer and fewer, if any at all, of our new members are registering for seminars or attending their own receptions. Many factors no doubt are cause for this, but the sentiment of the Board was that we as a membership could and should do more to involve the new members. In Brooke's first President's Message entitled, "The Enrichment of Meeting" [CACNews Q3 2016], she recalled how inspiring it was for her to meet the Board of Directors at her new member reception. Reading her message brought back so many memories from past seminars, and I thought, do I remember my new member reception? *Do you remember yours?* We discussed what it was about those moments that made them particularly notable or "different" feeling. What were the makings of those moments, both tangible and intangible, and how could we capture that or recreate the contexture of that for our new members to experience now? This will be an on-going conversation but on that night we did agree that the new member reception would return to something more formal whereby the new members would receive a formal invitation requesting their presence. We felt that this could help convey to new members just how much the Board and the membership *wants* to meet them.

Later that evening, I found myself, again, with wine glass in hand, sharing a table and engaged in conversation with John Houde, Dr. Peter De Forest, Charles Morton, Rebecca Bucht and Greg Laszkowski. (If anyone else was present and I did not mention your name, recall, my glass in hand never seemed to empty). Greg proposed to start something he termed the "Dinosaur Club," a club for older generations of criminalists ("the generalists"), I suppose to gather and connect over mutual shared interests and overall like-mindedness. But what was apparent to me was that Greg and perhaps his cohort no longer felt like they could identify or connect to younger generations of criminalists ("the specialists"). I gathered that one of the more prominent reasons for forming a separate club within the CAC mem-

What Makes Your Generation Unique?

| Millennial | Gen X | Boomer | Silent |
|----------------------------|--------------------------|---------------------|-------------------------|
| 1. Technology use (24%) | Technology use (12%) | Work ethic (17%) | WW II, Depression (14%) |
| 2. Music/Pop culture (11%) | Work ethic (11%) | Respectful (14%) | Smarter (13%) |
| 3. Liberal/tolerant (7%) | Conservative/Trad'l (7%) | Values/Morals (8%) | Honest (12%) |
| 4. Smarter (6%) | Smarter (6%) | "Baby Boomers" (6%) | Work ethic (10%) |
| 5. Clothes (5%) | Respectful (5%) | Smarter (5%) | Values/Morals (10%) |

Note: Based on respondents who said their generation was unique/distinct. Items represent individual, open-ended responses. Top five responses are shown for each age group. Sample sizes for sub-groups are as follows: Millennials, n=527; Gen X, n=173; Boomers, n=283; Silent, n=205.

bership included an outlet perhaps to commiserate over the “glory days” of criminalistics, which seem to be waning as a result of increased oversight and regulation coupled with lackluster criminalists deficient of scientific endeavor or fervor for the field. Perchance I was mistaken in my assessment of the intentions for the creation of such a club? Nevertheless I probed, as I am known to do from time to time (okay perhaps *all* the time). Maybe it was the haziness brought on by the wine and the residual warmth emanating off the desert surroundings, but I was emboldened to ask them all why they felt disconnected from the younger criminalists and why they perceived that the organization, in general, felt lacking of contemporary counterparts to Anthony Longhetti, Paul Kirk, Jack Cadman and their distinguished ilk. Perhaps the obvious underlying answer found within their responses was that there was generation gap impeding the relations among these groups of members. Surveys conducted by the Pew Research Center reflects that Millennials believe their generation’s most defining characteristics to be their use of technology and their lifestyle qualities such as music and pop culture. Contrastly, Boomers characterized their generation as unique due to their work ethic and respect for others.¹

It may be true that this generation gap is not nearly as wide or volatile as it was in the 1960s, but it seems the differences are substantial enough to keep those who’d be eligible to join the Dinosaur Club from conversing with our neophyte and journeyman criminalists. While having yet another glass of wine, I contemplated this, and the reasons for the lack of communication, and realized we’re not asking the right questions. Instead of wondering why “they” won’t talk to “us”, we need to ask how are we going to connect to them? Maybe the wall of disinterest built around the apprentice and journeyman could be cast aside along with their cell phones? And with the walls down, and with a little change of perspective one could recognize their need for mentorship and collaboration, rather than direction. Both generations need to *seek* to meet in the middle.

Refocusing the cornerstone of the wine and cheese reception back to the new members could be the key to bridging this gap. Starting with the simple action of receiving a formal invitation, new members will be apprised of the significance of the event. It is my own personal hope that the new member reception be regarded as an event of great import, recognized as it was for many of us, as a significant stepping-stone in our professional lives. At each wine and cheese reception and at every CAC event, I promise to talk to at least one person I don’t already know, and I challenge you all to do the same. Let us not be two ships passing in the night. Instead, with each interaction let’s continue to build together a rapprochement between new members and old members, which can develop into the fellowship that our association was meant to be. Through simple changes in our attitudes and actions, I believe that we can engender a considerable amount of respect and reverence for our roles in membership. Whether apprentice, journeyman or master, we are all apart of a great legacy forged by fellowship among scientists who found their true *métier* in forensics.

1. www.pewsocialtrends.org/files/2010/10/millennials-confident-connected-open-to-change.pdf

FEEDBACK ◀.....▶

Proper Terms

In the article “Hair Today, Gone Tomorrow” [CACNews 4th Q 2016] the use of the word “microphotograph” in the captions used to describe the photomicrographs on Figures 2, 3, and 6 through 30, is wrong. Microphotographs are very small photographs used as novelty items (J.B. Dancer slides) or in espionage (hidden in a hollow nickel). The proper usage of “photomicrograph” is in the text of the article on page 35. I did not find the word microphotograph in the text of the article. I would recommend changing the captions in the on line article.

—Ed Jones

Corrected Date

I assume it is too late to make a difference but I thought I would pass it along just in case. I got a call from Susan Miller last night letting me know that Ed’s widow, Ellen, who was well known among CAC members had just passed away. She also mentioned that she noticed, but missed it before, that I had made an error in the wedding date for Ed and Ellen. [Lindberg B. “Ed” Miller, CACNews, 4th Q 2016] For some reason I had it as 1960 when it was actually 1949. Other than my advancing age I have no explanation for the error.

—Chuck Morton

“Ness” Remembered

As Ness’s supervisor I can speak for all of us at the LAPD Forensic Science Division that we’re blessed with the good fortune to know Ness Palisoc. Whether coworker, close friend or acquaintance, Ness’s presence in our lives, even if only for a short while, enriched us all. For those of us that worked with Ness, we remember her as a hard working dedicated professional that never complained about the heavy caseload in the DNA Unit. Ness faced her illness with courage and dignity with an inspiring and moving spirit. May our dear sister Ness rest in peace. *“He will wipe away every tear from their eyes. There will be no more death or mourning or crying or pain, for the old order of things has passed away.”* (Rev 21:4)

—Larry Blanton

Forensic Uses for Very Accurate Density Determinations

You may know that back in 2013 I was a co-author of “Analyzing Forensic Evidence Based on Density with Magnetic Levitation,” *J. For. Sci.*, January 2013, 58(1).

Since then, Prof. Whitesides’ group (new members) have made great strides in how many places after the decimal (g/cc) that density may be determined, and as previously the apparatus is very inexpensive and the determination may be made quickly (once a validated procedure for that particular item type has been established). I’ve been asked to come up with examples of forensic evidence types where very accurate density determination would have investigative value. In many cases an added value of this magnetic levitation method is that it may also be used as a method of separating mixtures having particles of different density and collecting the

please turn to page 28



Ethical Dilemmas

DISCUSSION CORNER WITH CAROLYN GANNETT

Personal Use of Agency Resources

At what point does personal use become abuse?

The Scenario

You observe a coworker using the lab's photocopier after hours. He is making a few hundred flyers for his kid's school fundraiser. He tells you that his supervisor gave him written permission to use the photocopier and the lab's paper and ink supplies.

Is there anything unethical about this?

Discussion: A Legal Consideration

Probably all of us have used work supplies and equipment for personal tasks. Most of us don't think twice about an occasional personal call on the office phone. And then there are the pens, paper, binder clips, folders, and so on, that we barely think about if they wind up going between work and home. We may even photocopy a personal item here or there.

But, hundreds of flyers? At what point does personal use become abuse?

Fortunately, there is some guidance in place for those who are employed by our state's agencies. California Government Code Section 8314 says, in short, that it is unlawful for an employee to use public resources for personal purposes not authorized by law (see <http://codes.findlaw.com/ca/government-code/gov-sect-8314.html>).

The Code qualifies this, stating, "Personal purpose" does not include the incidental and minimal use of public resources, such as equipment or office space, for personal purposes, including an occasional telephone call." So, it appears that personal use of pens, paper, and clips, occasional phone calls, and even an occasional photocopy may be legal. But, the excessive photocopying by the coworker might be open to questioning.

What about the supervisor's approval—does that excuse the coworker's actions? According to the Code, it is unlawful "to permit others to use public resources for ... personal or other purposes which are not authorized by law." So, the answer may be that the supervisor, too, could be in violation of the Code.

How bad could the repercussions be to each of them? The Code continues: "... any person who intentionally or negligently violates this section is liable for a civil penalty not to exceed one thousand dollars (\$1,000) for each day on which a violation occurs, plus three times the value of the unlawful use of public resources."

Bear in mind, interpretation of Section 8314 ultimately rests with the justice system.

Discussion: Ethical Considerations

The actions in the scenario may or may not be deemed illegal by judicial experts, but do they indicate a breach of forensic science ethics?

If deemed illegal, then yes—sometimes. There are some ethics documents that explicitly address legal transgressions. And, different organizations have varying levels of unacceptable illegal conduct.

Some organizations' documents speak of felony convictions or crimes of moral turpitude. Such associations include ABC (IV.5.2), SWAFS (II.A, II.B), and ASCLD's *Code of Ethics* (2.9). Excessive photocopying does not seem to fall within the purview of these clauses.

Note that ASCLD's Code of Ethics applies only to members of ASCLD, not necessarily to employees of ASCLD-accredited labs. It is not to be confused with ASCLD/LAB's *Guiding Principles*, which asserts an ethical obligation to report illegal conduct (paragraph 5). Given our scenario, government employees in California who answer to the *Guiding Principles* might have an ethical obligation to report both the photocopying individual and his supervisor "to the appropriate legal or administrative authorities," if the conduct is indeed determined by legal experts to be a violation of the Code.

Some documents consider *any* illegal conduct to be unethical. ASCLD's Code of Ethics (2.1), IAI (1.08), ICSIA (P10), SWAFS (I.C, II.A), and ASCLD's *Guidelines for Forensic Laboratory Management* (par. 3) have such content. Presumably, the photocopying in our scenario and its allowance by the supervisor, or even a single parking ticket, could be found to be an ethical violation. The wording in these documents may be too broad.

You observe a coworker using the lab's photocopier after hours. He is making a few hundred flyers for his kid's school fundraiser. He tells you that his supervisor gave him written permission to use the photocopier and the lab's paper and ink supplies.

One document (IABPA 4.2.1) speaks of "illegal conduct that adversely reflects upon the professional competence of the member or upon the Association as a whole." Excessive photocopying appears not fall under this clause.

Most forensic science ethics documents do not explicitly address illegal conduct. However, they may have other concepts which could be construed to apply. These include clauses on honesty, acting with integrity, exemplary personal conduct, maintaining the public trust, and so on. But, often such clauses are so broadly worded that they can be interpreted to apply to just about any conduct brought into question. The usefulness of such clauses can be limited.

There is a relevant clause in ASCLD's *Guidelines for Forensic Laboratory Management Practices*. If you think you've never heard of this document before reading this article, but you have heard of ASCLD/LAB's *Guiding Principles*, then your thinking is in error. Paragraph three of the *Guiding Principles'* Preamble, invokes ASCLD's *Guidelines*. I encourage you to not only re-read that paragraph, but to become familiar with ASCLD's *Guidelines*, and then review them annually. They can be found here: <http://www.asclcd-lab.org/wp-content/uploads/2013/04/labmgtguide.pdf>.

On page 2, under "Efficiency" ASCLD's *Guidelines for Forensic Laboratory Management* states: "Laboratory managers should ensure that laboratory services are provided in a manner which maximizes organizational efficiency and ensures an economical expenditure of resources and personnel." An argument could be made that allowing large-scale personal use of laboratory resources is not an economical expenditure of resources. However, this may be open to interpretation.

In Summary

Whether the conduct in this scenario is a clear breach of ethics relies primarily on whether the actions are illegal, to what extent, and whether any applicable ethics documents address this degree of illegal conduct.

What is not so clear is any attempt to apply broad ethical concepts such as honesty, integrity, or public trust to the conduct in the scenario. Arguments could be made on both sides when evaluating individuals' actions against such nebulous criteria.

ASCLD's *Guidelines for Forensic Laboratory Management Practices* offers an argument against the conduct in the scenario. Still, the relevant clause may be open to interpretation.

A lab or agency may have a policy that directly speaks to the actions in the scenario. Appealing to such an edict may be the most straightforward means of resolving the matter, avoiding any questions of legality or ethics.

In the absence of such a policy, a lab may find it most expedient to simply err on the side of caution, and disallow large-scale uses of agency resources.

At the very least, laboratory employees and management should be aware of the content found in California Government Code Section 8314.

Acronyms

ABC American Board of Criminalistics
ASCLD American Society of Crime Laboratory Directors
ASCLD/LAB ASCLD/ Laboratory Accreditation Board
IABPA International Association of Bloodstain Pattern Analysts
IAI International Association for Identification
ICSIA International Crime Scene Investigators Association
SWAFS Southwestern Association of Forensic Scientists

criminalists began dealing with the "CSI effect" during testimony. Juries no longer accepted some items not being tested, and workload increased for a better show in court. During this decade, we saw an increase in automation and film being replaced by digital photography. There was also the establishment of assorted working groups in the various forensic specialties. The NAS Report came out in 2009 and caused us to take a deeper look at the way we operate in the criminal justice system.

In the 2010's, we have seen the exponential growth of cell phone and computer forensics cases due to the information age. Working groups have become more formalized with the establishment of the OSACs. The CODIS DNA database has expanded with more loci and improved tools for searching. And then there was PCAST. It is yet to be determined where, if anywhere, that will go.

This year we have seen many laws change that will affect crime laboratory operations.

Governor Brown, yet again, signed a law that changes California's "assault weapon" definition requiring individuals in possession of certain rifles to register them with the state or be in the possession of contraband. Crime laboratories will be expected to educate law enforcement agencies of the new assault weapon definition changes as well as all the other firearm law changes, like the high capacity magazine ban. There may be an increase in calls for firearms criminalist's expertise in 2017.

California legalized the recreational use of marijuana, allowing Californians to possess, transport, buy, and use up to an ounce of cannabis for recreational purposes and allow individuals to grow as many as six plants. It allows for future retail sales of marijuana. There may be more toxicology work with respect to impaired driving cases. Controlled substance analysts will need to document weights.

Legislation passed to have the Dept. of Justice's Bureau of Forensic Services, the California Association of Crime Laboratory Directors, and the CAC provide leadership and work collaboratively with public crime laboratories to develop a standardized sexual assault forensic medical evidence kit for use by all California jurisdictions. This takes us back to the late 1990's and early 2000's when California crime laboratories collaborated to provide input into updating the standardized forms in SART kits in California. In 2017, we will look into further collaboration to improve and standardize the kits themselves.

In the next decade, we might see Rapid DNA analysis at police booking stations and STR DNA analysis giving way to Next Generation Sequencing. We may be able to tell the police physical characteristics of a suspect based on DNA testing. Computer forensics should continue to boom. I think the new technologies, laws, and policies on the horizon for forensics in California for 2017 will also initiate changes. Not only will we need to continue to focus on casework, but we must also set aside time for validations, accreditation, and various working groups. This will make us busier. In 2017 and beyond, the criminalist will be required to be more than a lab rat. The criminalist will need to become an all-around worker within the criminal justice system aware of law changes, accreditation requirements, and certification within their specialized discipline of forensic science. Past hot topics established what the CAC was meant to stand for. It caused us to make improvements and initiate future changes.

Share your thoughts and dilemmas at
www.ethicsforum.cacnews.org

CAC Fall Meeting with ASTEE

“Find Your Oasis in Forensic Science”

Inspiration flowed like desert rain at the Rancho Mirage joint meeting of the CAC and American Society of Trace Evidence Examiners. Seeing familiar colleagues and making new friends is always the best part of a CAC meeting but this one had the additional benefit of a rich array of workshops and speakers. The vendors, always the backbone of any successful meeting, provided excellent food served with the latest forensic technology. Above it all flew the Riverside DOJ lab's efficient crew, making the event run smoothly. Oasis indeed.



❖ WORKSHOPS



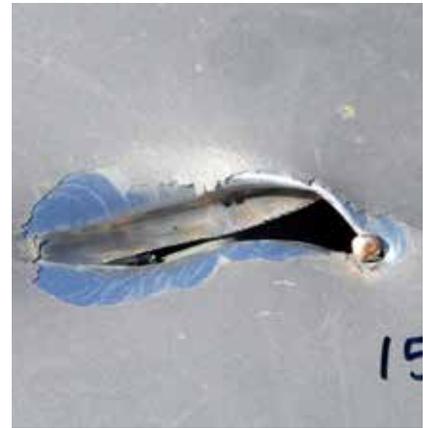
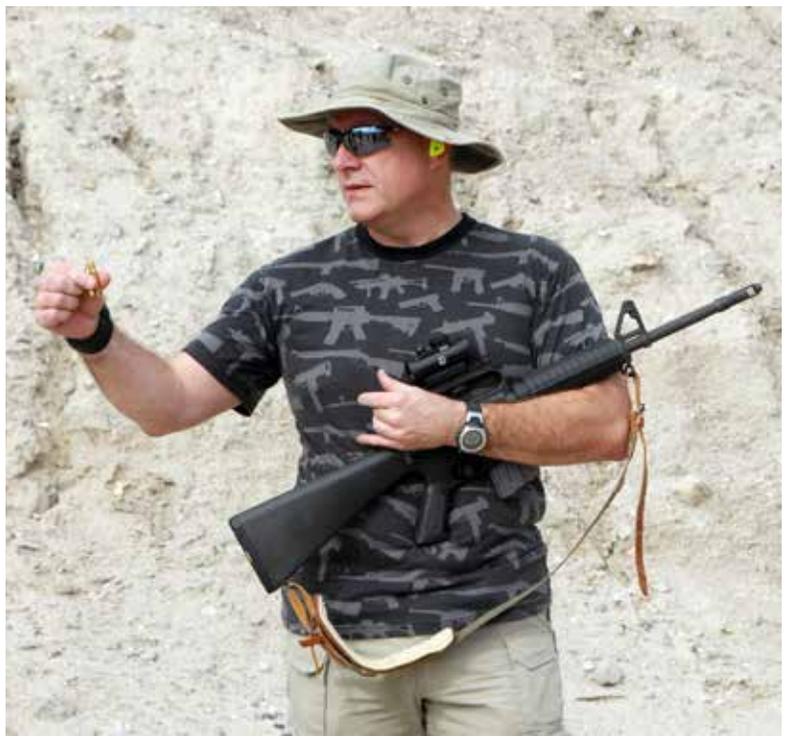
SOIL RECOGNITION and COLLECTION



WORKSHOPS

SHOOTING INCIDENT RECONSTRUCTION





WORKSHOPS

DYES, DYEING and Natural FIBERS



(left) the seminar attendees representing the ASTEE group.

All of the photos on these two pages are courtesy Gina Williams.

TRACE FACTORY TOURS INLAND POWDER COATING



GENERAL SESSION







Your 2016-17 CAC Board of Directors. (l-r) Editorial Secretary Meiling Robinson, Recording Secretary Gunther Scharnhorst, Regional Director (North) Cindy Anzalone, Membership Secretary Megan Caulder, President Brooke Barloewen, Regional Director (South) Jamie Daughetee, Treasurer Helena Wong, Immediate Past President Chris Coleman, President Elect Vincent Villena.





VENDOR BREAKS

Banquet at Village Watutu



Gina Williams photo

ABSTRACTS FROM THE FALL 2016 CAC SEMINAR

DNA Workshop

Emerging Trends in Rapid DNA Legislation and Technology

Kevin Bekak, Kay Strohl, and David King, IntegenX Inc.

In January 2015, the United States Congress introduced legislation which will enable rapid DNA technology to be installed in booking stations across the country. The key advantage of rapid DNA technology is that arrestee DNA profiles can be generated, uploaded to CODIS, and ultimately report a hit/no-hit result in real-time during the booking process. Since their introduction, the Rapid DNA Acts of 2015 (HR 320) and 2016 (S 2348) have gained broad support from victims' advocacy groups, industry associations representing forensic scientists, prosecutors and law enforcement officials, and the Federal Bureau of Investigation. In June 2016, the US Senate passed S 2348 by unanimous consent. Shortly after, the US House of Representatives Judiciary Committee approved the language of HR 320 and recommended it for a floor vote. The R-DNA Act will dramatically change arrestee DNA procedures in the 32 states which have active arrestee programs.

This workshop will examine the benefits of the legislation and explore the new collaborative workflow between forensic DNA laboratories and booking stations, as arrestee DNA testing moves outward from centralized state labs. Additionally, the workshop will discuss the status of commercially available rapid DNA platforms. Lastly, the developmental validation of IntegenX's second generation Rapid DNA System will be discussed. This platform is designed to work in wide-scale hub-and-spoke deployment, with a software application enabling remote control and monitoring of systems in the field. Attendees of this workshop will be prepared for the impending changes in arrestee DNA testing brought on by new legislation and technology.

Probabilistic Genotyping Using the Exact Method

Kent M. Harman, Genetic Technologies, Inc.

Probabilistic genotyping (PG) has headed down the overly complex Markov Chain Monte Carlo method and proprietary algorithm path which is causing admissibility problems across the US. However, PG using the exact method is manually verifiable, reproducible, and understandable.

Bullet is an application developed by the eDNA Consortium that will calculate complex mixtures to include differentially degraded suspected profiles and include robust degradation curve capability. Bullet has extended the novel concept of combining the "Exact Method" of probabilistic genotyping with Tvedebrink's Probability of Dropout and Degradation Curve models to address differential degradation. Kent will address the advantages of the Exact method as compared to Markov Chain Monte Carlo methodologies and provide further understanding using casework examples.

The purpose of the presentation will be to introduce the Bullet tool (free to all Consortium member agencies) and to step through the algorithm demonstrating that PG does not need to be a black box.

Rapid Nucleic Acid Extraction Technologies Amendable for Field-Deployable Human Identification

Tanya M. Ferguson, Ph.D., Mark T. Brown, Ph.D., and Robert Doebler, Ph.D., Claremont BioSolutions

Since the inception of DNA fingerprinting or DNA profiling technology in the 1980s, law enforcement and intelligence agencies have relied heavily on DNA extraction from biological specimens for human identification. Sources of DNA can range from biological fluids (e.g. blood, semen, saliva) to touch DNA-generating epithelial cells, which is moving to the forefront as the most desired and successful test for forensic DNA laboratories. Regardless of the downstream genotyping analysis for human identification (e.g. RFLP, PCR, STR), sample integrity and risk of contamination are major concerns both during evidence collection in the field and during processing in the lab.

In an effort to facilitate nucleic acid extraction, Claremont BioSolutions (CBio) has developed novel ample preparation methods for the rapid isolation of DNA or RNA using OmniLyse®, PureLyse®, DNAexpress™, and RNAexpress™ technologies. Compact and field deployable, these technologies can be used to isolate nucleic acids from eukaryotes and prokaryotes present in a variety of sample matrices (i.e. stool, sputum, blood, soil, saliva, buccal swabs, and tissue) in as little as 15 minutes. Initial testing of DNA isolated from fingerprints on a glass surface or tape-lifted from metal and plastic surfaces, resulted in more quantifiable DNA than other commercially available kits. This was achieved in less than 15 minutes, with no external instrumentation (e.g. centrifuges) required. CBio has further demonstrated the extraction of intact DNA from saliva and buccal swabs, with similar yields as other commercially available kits. These extraction technologies are customizable, depending upon the application, and can be integrated into a cartridge format to allow for automated sample preparation solutions via CBio's SimplePrep® X8 or X1 instruments, with the latter being portable for on-the-spot extractions in less than 10 minutes. Therefore, due to the speed, portability, and customizability for a variety of field and lab-based applications, CBio's sample preparation technologies are well-suited for human identification within the DNA forensics arena.

Development and Validation of a Targeted Next Generation Sequencing Solution for Forensic Genomics

Melissa Kotkin, Illumina

Sequencing (NGS) by Synthesis (SBS) enables the entire human genome to be sequenced in one day. As a simpler, yet highly effective alternative, forensic scientists can choose to perform targeted sequencing of PCR products. By sequencing a dense set of forensic loci, casework and database efforts are directed toward the genomic regions that best answer forensic questions, relieving privacy concerns and simplifying analysis. Because it does not depend on allele separation by size, the number of targets interrogated is not limited, allowing a more comprehensive result to be generated.

We describe the development and validation of a targeted amplicon panel for forensic genomics that combines a core of global short tandem repeat markers used routinely today, along with additional forensic loci that can provide information when standard markers would fail to sufficiently resolve a case. Maximizing the number and types of markers that are

analyzed for each sample provides more comprehensive and discriminating information for standard samples, as well as challenging samples that contain low quantities of DNA, degraded and/or inhibited DNA, and complex mixtures. The targeted amplicon panel will enable more complex kinship analysis to be performed, and can also reveal phenotypic and biogeographical ancestry information about a perpetrator to assist with criminal investigations. This capability is expected to dramatically improve the ability to investigate dead end cases, where a suspect reference sample or database hit are not available. We will describe the complete workflow, system, and data analysis tools, and present data from validation and collaborator studies including reproducibility, sensitivity, actual forensic samples, and concordance with standard capillary electrophoresis methods.

Streamline Your Validation with Hassle-Free QIAGEN Validation Services

Pamela Jarman, QIAGEN

This presentation will provide an overview of QIAGEN's validation services that can be tailored to your laboratory's needs. Validation services can consist of comprehensive validations that are worry-free and hands-off for the laboratory, as QIAGEN handles all planning, laboratory work, analysis, and data reporting. Alternatively, validation services can be a joint effort between QIAGEN and the laboratory staff to allow the laboratory staff involvement in the entire process. Any portion of the DNA testing process, for casework or databasing can be included in QIAGEN validation services.

Significant Cases Where DNA was Paramount

Daima Calhoun, Riverside County District Attorney's Office

Three cases where DNA was used to identify the assailants will be discussed. The facts, the role DNA played, and the outcome of each of those cases will be discussed.

Effective Courtroom Presentation of DNA Evidence

Daniel DeLimon, Riverside County District Attorney's Office

This 1-hour presentation will focus on strategies for effective presentation of DNA evidence in court, including; 1) prosecutor / DNA analyst joint coordination of evidence to be tested; 2) pretrial preparation including exhibits and pretrial conferences; 3) courtroom testimony; and 4) dispelling confusion created by defense DNA experts.

How Thinking "INSIDE" the Box Helped Solve an Aspiring Model's Death 25 Years Later

Steve Renteria, Los Angeles County Sheriff's Department Crime Lab

On April 29, 1985, Jo Ann Marie Jones disappeared from the City of Long Beach while leaving her boyfriend's apartment early that morning.

Her boyfriend called her work and learned she never made it in that day. Her family reported her missing. Three days later, her boyfriend saw a male, Stafford Spicer, driving Jo Ann's blue Camaro and called the police. The police arrested Spicer but later released him based on lack of evidence. On June 8, 1985, fisherman returning to their car in the local

mountains noticed a foul odor and discovered a decomposed body. The body was later identified as Jo Ann Marie Jones.

At the time, authorities did not have sufficient evidence to charge Spicer with her murder. The Los Angeles County Sheriff's Department Crime Lab analyzed items from the car, but did not obtain any probative results. The case was re-opened 25 years later utilizing Federal Cold Case Grant monies. With current quantitation and amplification techniques, the laboratory was able to go back to the original evidence analyzed back in 1985 to produce new investigative leads which helped solve the case and bring closure to the family.

Eyeball in Formalin: Understanding the Effects of Formalin on the Double Helix

Elias Valencia, California Department of Justice, Riverside Lab

This presentation will discuss the challenges of extracting DNA from eye tissue that had been in liquid formalin for an extended period of time, as well as pre-extraction treatment and extraction protocol modifications to try to overcome the effects of formalin on DNA.

Sexual Assault Case Studies with DNA Results

Diana Faugno, Eisenhower Medical Center

This presentation will provide case studies of sexual assault. The history of events will be presented followed by short summaries of the swabs collected. The medical findings of injuries will also be presented so the scientist might understand the most common injuries seen in these cases. Oftentimes, the examiner does not know the outcomes from the crime lab so importance of this communication will be mentioned as well.

Case discussions must have confidentiality as it relates to photographs and case information. Forensic Nurse Examiners typically function autonomously and need to discuss difficult cases. Most SANE/FNE programs contain a variety of nurses with varied backgrounds and levels of experience. Teamwork and discussion will offer educational benefit to the individual examiner team. The criminalist is part of that team.

The following cases will be discussed: 1) touch DNA from the band of underwear; 2) serial rapist; 3) DNA on a nightgown; 4) child case; and 5) 15 year drinking hotel.

The objectives include: 1) discussion of individual sexual assault cases with DNA findings and implications for collection of swabs, clothing, and body fluids; 2) demonstration of sample documentation report for the scientist to review history and assist in prioritizing analysis; 3) listing outcomes of cases, if known; and 4) discussion of Rapid Analysis DNA (RADS) program at Eisenhower Medical Center.

Lean Six Sigma White Belt Training

Heather Jamieson, Sorenson Forensics

Whereas the rate of violent crimes has been decreasing markedly, requests for laboratory testing of evidence have increased radically. This unprecedented wave of evidence testing is due to many factors, including heightened awareness of the power of forensic examinations, increasing complexity of investigations, and advances in technology that warrant re-analysis of evidence. The increase in caseload has resulted in staggering backlogs and considerable delays in reporting

results, which, in turn, lead to delays or even dismissals of criminal investigations. To address these issues, laboratories have hired additional personnel, invested in new technologies, and outsourced casework. Unfortunately, for most, the return on investment has not been realized, as many gains can not be sustained.

General Session

Authentication of the Missing 9/11 American Flag from Ground Zero, New York City

William M. Schneck, Microvision Northwest-Forensic Consulting, Inc.

Raising the Flag at Ground Zero is an iconic photograph taken by Thomas E. Franklin of The Record (Bergen County, NJ), on September 11, 2001. The picture shows three New York City firefighters raising the American flag at Ground Zero of the World Trade Center, following the September 11th attacks. The flag came from the yacht 'Star of America', owned by Shirley Dreifus, which was docked in the yacht basin in the Hudson River at the World Financial Center. Firefighters cut the yardarm off of the yacht with a K-Saw and then took the flag and its pole from the yacht to an evacuation area on the northwest side of the site. They found a pole about 20 feet off the ground where it was proudly displayed. The city thought it had possession of the flag after the attack, Mayor Rudolph Giuliani and George Pataki signed it, and it flew at the New York City Hall, Yankee Stadium, and on the USS Theodore Roosevelt (CVN-71) during its service in the Middle East. Even a U.S. postage stamp was printed honoring the flag. However, when the flag's owner prepared to formally donate the flag, it was discovered that the original 3 x 5 foot flag was replaced with a larger flag five hours after it was raised and photographed. Television shows such as *Lost History*, have documented the missing flag. In 2015, an individual briefly entered a fire station in Washington State dropping off what he said was the 9/11 flag from New York City. This presentation will discuss the forensic analysis conducted by this author in the authentication of an American icon which will be on display at the 9/11 Museum in New York.

Crime Scenes with Chemical Hazards: Working in a Hazardous Environment

Brian Escamilla, Network Environmental Systems, Inc.

Most drug labs are treated as hazardous materials sites and handled by specially trained law enforcement personnel wearing chemical protective equipment and respirators. But, certain situations involving fatalities may involve non-hazmat trained personnel investigating a scene where hidden chemical hazards exist. This presentation will highlight cases where criminalists and other crime scene investigators have had to work with hazmat personnel in investigating crime scenes. The scene hazards, recognition of evidence, recommended protocols, and necessary personal protective equipment for handling the body and evidence will be addressed.

Wrongful Convictions in the United States

Alissa Bjerkhoel, California Innocence Project

Wrongful convictions have plagued the United States since its inception and only in the past two decades has there been a nationwide movement to seek out and rectify these cases. It is no small task. The United States represents about 4.4% of the world's population, yet it houses around 22% of the world's prisoners. At the same time, it is estimated that between 2.3% and 5% of these prisoners are innocent.

California, which boasts the second largest prison population in the nation, has a tremendous need to help those wrongfully convicted. To date, there have been 164 California exonerations since 1990 by innocence organizations, such as the California Innocence Project, private firms, and prosecutor conviction review units. But there is much work to be done not only to get innocent people out of prison and support them when they are free, but also to improve the criminal justice system so that such wrongful convictions can be prevented and rectified.

Causes of wrongful convictions and case examples will be discussed.

The Pietrzak Murders: A Case Study

Daniel DeLimon, Riverside County District Attorney's Office

On October 15, 2008, Riverside County Sheriff's Department personnel responding to a "check the welfare" call found the bodies of USMC Sgt. Janek Pietrzak and his wife Quiana Jenkins-Pietrzak in their home. Sgt. Pietrzak was bound, gagged, and beaten. Quiana was stripped naked, bound, blindfolded, and sexually assaulted. They had been executed side by side in the living room of their new home. Approximately two weeks later, investigators identified a potential suspect in the case and the investigation that followed resulted in four fellow, active duty United States Marines being arrested for the double homicide. All four men were convicted and three received death sentences. The crime scene processing, initial investigation, interviews, the forensic work that supported the convictions, and the sentences will be discussed.

Deceased Inmate DNA Database (D3) Program

Tobi Kirschmann, California Department of Justice, Jan Bashinski Lab

It is estimated by the California Department of Corrections and Rehabilitation (CDCR) that over 10,000 inmates and parolees under its jurisdiction did not provide DNA specimens prior to their death. In an effort to reduce this number, the CAL DNA Data Bank designed the Deceased Inmate DNA Database (D3) program, and launched it in February 2011.

The goal of the D3 program is to obtain DNA specimens from deceased inmates and parolees, develop searchable DNA profiles, and upload them to the national Combined DNA Index System (CODIS) convicted offender index to be searched against forensic unknown profiles from unsolved cases. The most typical type of D3 specimen is whole blood but the program also accepts blood stains, swabs, finger/toe nails and tissue. Specimens usually arrive via medical examiner or coroner but could be from any law enforcement agency. D3 specimens must be from qualified convicted offenders who died in custody, and their qualification is documented in court or agency records or in a law enforcement database.

The D3 program has great potential in solving future cold cases and exonerating the innocent. Currently, there are three counties actively participating in the D3 program and

there has been one match to a forensic unknown. With continued support, promotion, and recognition, the D3 program strives to be active in all counties in California.

Know Your Sitter --A Toddler Death

Jamie Daughetee, Los Angeles County Sheriff's Department Crime Lab

This is a case presentation of a toddler death. The crime scene, DNA evidence, and reconstruction will be discussed. This case brought about some interesting challenges, which included the blood spatter interpretation, managing expectations of the laboratory analysis, and drawing conclusions.

The Kelle Jarka Case

Marianne Stam, California Department of Justice, Riverside Laboratory

On April 28, 2008, Kelle Jarka returned home after a morning coffee run. He drove his white Lexus into the garage before he noticed that something was amiss. Mr. Jarka entered the partially open door leading from the garage into the house and heard his baby crying. He later found his wife, Isabelle, dead from an apparent head wound in an upstairs bedroom.

The police were called and the investigation began. This presentation will show the value of observation and asking the right questions when at a crime scene.

Trace Evidence and Scene Reconstruction

Peter De Forest, Forensic Consultant, New York, Ralph R. Ristenbatt, Pennsylvania State University

The power and potential of trace evidence will be discussed. The use of trace evidence extends well beyond the narrow domain of associative evidence problems. This is certainly not widely appreciated. Typically, trace evidence is thought of as always requiring time intensive analyses and producing results with low probative value. This mistaken perception has led to serious adverse consequences.

Some of the following assertions will be made in connection with case examples during the body of the presentation:

1. Trace evidence and an effective scene investigation are inextricably entwined.
2. Every case presents unique problems. For the approach, one size does not fit all.
3. Ideally, the physical (trace) evidence problem must be defined early at the crime scene, not later in the laboratory.
4. Recognition of trace evidence at the scene can be absolutely essential.
5. A trace that goes unrecognized at the crime scene cannot contribute to the case solution. It is lost and gone forever. Thus, the case solution may vanish without a trace.
6. Scientific reasoning in the reconstruction process can be used to predict the existence of confirmatory trace evidence.
7. The criminalist should engage in an open-ended inquiry.

Legal Updates

Michael Chamberlain, California Department of Justice

This presentation will advise attendees of pending legislation and ballot initiatives that may impact crime laboratory

operations, including provisions addressing firearms, marijuana, sex crime statutes of limitation, and the death penalty. Other recent legal developments will be identified, such as the California Supreme Court's significant July decision in *People v. Sanchez* clarifying the law of expert witness testimony.

Stipend to Present at 2017 IAI Conference in Atlanta, Georgia

Gregory Laskowski, Criminalistics Services International, LLC

NIST is providing two stipends to anyone who is selected to present a paper at the 2017 IAI annual education and training conference in Atlanta, Georgia from August 6 through 12. Abstracts must be submitted no later than December 31, 2016. Abstracts can be submitted via the IAI website by clicking on the NIST abstract button or sent via e-mail to crimservint@earthlink.net. The two winners will receive vouchers from NIST that covers registration, lodging, and domestic travel.

We will accept papers in the fields of traditional criminalistics including DNA (how it relates to evidence collection), questioned documents, forensic odontology, and forensic anthropology. Selected presenters must agree to register for the IAI conference and submit their abstracts to the Program Chair prior to the due date. They must list that their presentations fall under the discipline of general forensics. NIST employees and contractors are not eligible to receive these stipends.

NIST Ballistics Toolmark Research Database

Johannes Soons, National Institute of Standards and Technology (NIST)

The NIST Ballistics Toolmark Research Database (NBTRD) is an open-access research database of firearm toolmarks on bullets and cartridge cases. The goals of the database are to:

- 1) Foster the development and rigorous validation of novel measurement methods, algorithms, metrics, and quantitative uncertainty estimates for objective firearm identification,
- 2) Address concerns about the limited scientific knowledge base on the similarity of marks from different firearms and the variability of marks from the same firearm, and
- 3) Ease the transition to the application of three-dimensional (3D) surface topography data in firearms identification.

The database was developed in response to a 2009 report by the National Academy of Sciences that expressed concern about the objectivity of visual firearms identification by forensic examiners. The National Academy urged the development of objective comparison criteria and statistically rigorous methods to quantify the degree of uncertainty in an identification result so that juries can evaluate the weight of the evidence. The NBTRD currently contains over 1600 test fires and is designed to grow into an ever more diverse database through crowd sourcing of test fires and data from firearms all over the world. NIST partnered with industry and the forensics community to standardize the data exchange format for 3D surface topography data. The format enables the unambiguous exchange of data from various organizations, studies, and instruments. The development of the database is sponsored by the National Institute of Justice of the Department of Justice. The database can be found at:

<http://www.nist.gov/forensics/ballisticsdb>

Plastic Bags and a Couple of Bad Eggs

Donald J. Petka, Orange County Crime Laboratory

Typically when plastic bags are encountered in case-work, they contain drugs of abuse. In extremely rare cases, these bags may be planted on an unsuspecting victim. A case review will be presented in which polarized light microscopy was used to compare zip closure plastic bags planted in the victim's vehicle to plastic bags obtained from a suspect.

San Bernardino Mass Shooting: Lessons Learned

Lieutenant David Green, San Bernardino Police Department

On December 2, 2015, 14 people were killed and 22 were seriously injured in a terrorist attack at the Inland Regional Center in San Bernardino, California. This event and others are leaving law enforcement professionals asking themselves if this is the new normal. Learn more about the event timeline, suspect profiles, and valuable lessons learned by first responders.

Probative Value of Very Small Particles Adhering to Common Items of Physical Evidence

David A. Stoney and Paul L. Stoney, Stoney Forensic, Inc.

Particle Combination Analysis uses co-occurring particles to test alternative attribution hypotheses. One application of Particle Combination Analysis is the exploitation of the thousands of very small particles (VSP) that are found in and on items of evidence, using these particles to test associations and enhance probative value. VSP combinations are so complex that until recently there was no practical method to identify and interpret these combinations.

This presentation will cover the current state of our NIJ-funded research. The emphasis is on the application of statistical methods to SEM/EDS analytical results for VSP recovered from surfaces of common items of physical evidence: handguns, cell phones, ski masks and drug packaging. Prior related research results are available from the NIJ at the following web addresses:

www.ncjrs.gov/pdffiles1/nij/grants/239051.pdf; www.ncjrs.gov/pdffiles1/nij/grants/248904.pdf.

VSP were collected from actual items of evidence from cases in one Southern California jurisdiction. Particles were harvested from plastic drug packaging using commercially prepared (GSR-type) SEM stubs. Slightly moistened swabs were used to recover VSP from handguns, cell phones and ski masks. The SEM stub specimens were suitable for direct SEM/EDS processing. Swab specimens were prepared by aqueous extraction, low vacuum filtration onto polycarbonate filters, and mounting on SEM/EDS stubs. For each specimen VSP were characterized by SEM/EDS analysis, binning the analytical response for each particle into x-ray energy bins corresponding to a set of 18 elements.

Sets of target particle types (TPTs) were defined based on normal mixture modeling using a training set composed of random sampling from all sources. Multinomial distributions were defined for each source based on the numbers of particles corresponding to each of the TPTs. For comparison of TPT profiles the probability density of the observed count in a test specimen was assigned in each of the N multinomial densities (corresponding to each of potential sources). This probability was used as the measure of correspondence to

each of the reference sources. The probabilities can be used for classification or for ranking of candidate sources as in a library search. Measurements of probative value were defined using a Bayesian classifier applied to the multinomial probability densities, assuming an equal prior among all N classes.

This project was supported by Award Nos. 2012-DN-BX-K041 and 2015-DN-BX-K046 awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. The opinions, findings, and conclusions or recommendations expressed in this presentation are those of the instructors and do not necessarily reflect those of the Department of Justice.

The American Academy of Forensic Sciences Standards Board (ASB) Firearm and Toolmark Consensus Body

Gregory Laskowski, Criminalistics Services International, LLC

The American Academy of Forensic Sciences created the Standards Board (ASB) as a response to the need for standardization from the forensic community. This was in line with recommendations in the 2009 NAS report. It is now working in cooperation with the Forensic Science Board of the Organization of Scientific Area Committees (OSAC). This presentation will discuss the inception of the ASB, its legal status as an entity, its membership, its mission, and a discussion on its consensus bodies with particular emphasis on the discipline of firearms and toolmarks.

The Persistence of Ignitable Liquids on Laundered T-Shirts

Michelle Corbally, Redwood Toxicology Laboratory

When attempting to set fire to a material that is relatively difficult to ignite, a perpetrator may turn to an ignitable liquid to accelerate the growth of the fire. These ignitable liquids may potentially be spilled onto the clothes of the person who is pouring it. It has been questioned whether or not these ignitable liquid residues could be washed off in the course of laundering, as would be the case if someone was trying to eliminate evidence of having committed arson. This study sought to determine if ignitable liquids could be detected on cotton, polyester, and nylon t-shirts after they have been cleaned in a conventional residential washing machine. Different volumes ranging from 10 mL to 100 uL of a 1:1 mixture of gasoline and diesel fuel (a heavy petroleum distillate -HPD) were added to half of a t-shirt. This t-shirt fragment was inserted into the washing machine with another t-shirt fragment without ignitable liquids in order to test how efficiently ignitable liquids would transfer from one shirt to another. One detergent was investigated to determine if it has an effect on the retention of ignitable liquids on the t-shirts, relative to simple water immersion and agitation. A subsection of the test shirts was dried in a dryer to evaluate the extent to which any ignitable liquids remaining after washing with detergent would evaporate during the drying process. The presence of ignitable liquids was determined using passive headspace extraction with activated charcoal strips and gas chromatography-mass spectrometry (GC-MS). Gasoline and/or a HPD could be identified on all of the samples spiked with 10 mL of the standard accelerant mixture (SAM) for all washing conditions (water only, detergent added, and detergent with subsequent drying). At the 1 mL spike level, at least one of the ignitable liquids in the SAM was potentially identifiable for the different wash-

ing conditions, but the fabric type had an observable effect on which ignitable liquid was identified. At 100 µL, there were some indications of ignitable liquids on the cotton and nylon fabrics. However, for the polyester samples, ignitable liquids could not be identified once detergent was used and were detected at an even lower abundance once drying was incorporated. The different fabric types, use of detergent, and volume of ignitable liquid each had an observable impact on the final appearance and identifiability of the ignitable liquids. These variables also affected the extent to which the components of the ignitable liquids transferred to secondary pieces of fabric. The transfer to secondary pieces of fabric and the surprising retention of ignitable liquids through laundering has potentially important implications.

Synthetic Drugs in San Diego: Creating a New San Diego Municipal Code Ordinance

Lisa Merzowski, San Diego Police Dept Forensic Science Section

Starting in November of 2015 and continuing until about March of 2016, the City of San Diego experienced an unprecedented outbreak of hundreds of spice overdoses. The San Diego Police Department, in partnership with the City Attorney's Office, went to work trying to combat this growing problem and, in the process, learned that the current State laws that attempt to regulate synthetic drugs, such as spice, are inadequate for criminal enforcement. With this in mind, the Police Department and the City Attorney's Office created an ordinance to protect the public that makes sales and possession of synthetic drugs, such as spice, illegal. As a laboratory, we had to determine how we would support this new and groundbreaking ordinance. With so many novel synthetic drugs being created and no standards available, would we be able to identify the material being sold on the street? This presentation will talk about the journey from street to law and how the laboratory supports the new ordinance.

The Importance of Digital Evidence in Human Trafficking Investigations

Detective Luis Carrillo, San Diego County Sheriff's Office -San Diego Human Trafficking Task Force

This presentation will discuss various human trafficking cases containing digital evidence. It will cover the facts in these cases and the role digital evidence from mobile devices played in the investigations.

An Overview of how Personal Electronic Data can be Collected and Used

Ngoc Tran, California Department of Justice, Riverside Laboratory

With the rapid advances in computing power and technology, it is difficult to live in today's society without leaving an electronic footprint. This brief presentation focuses on a curious person's analysis on how some federal and local agencies and the private sector can construct a map of citizen activity based on their digital trail and the ways in which these digital artifacts have been used.

Digital Evidence's Role in Solving Police Investigations

Detective Wade Stern, Univ of California Riverside Police Dept

This presentation will discuss various cases containing digital evidence. It will cover the facts in the cases, the many different sources of digital evidence and the role they played in these cases, and their outcomes.

National Drug Trends

Todd Davis, Drug Enforcement Administration (DEA)

Over the past 10 years, the drug landscape in the United States has shifted. The opioid threat, consisting of controlled prescription drugs, fentanyl, and heroin, has risen to epidemic levels, and currently impacts significant portions of the United States. The methamphetamine threat remains prevalent, but the production source shifted from domestic to foreign. The cocaine threat was in a state of steady decline, but indications suggest the cocaine threat may be rebounding. Law enforcement focus on marijuana continues to evolve due in part to the national discussion surrounding legalization efforts, while domestic production has increased. The New Psychoactive Substances threat is challenging for law enforcement and policymakers, with synthetic cannabinoids and synthetic cathinones being marketed to a larger user base. Transnational criminal organizations, and domestic gangs, are more intertwined with the end goal to fund their organizations. These groups continue to smuggle millions of dollars in U.S. currency through established money laundering methods.

People versus Holman: Solving a 44 Year Old Cold Case

Meiling C. Robinson, LAPD Forensic Science Division Field Investigation Unit Beth Silverman, Los Angeles County District Attorney's Office

On August 27, 1972, Meyler's daughter and son-in-law discovered the body of 78-year-old Helen Meyler in her bed inside of her apartment. Meyler lived alone on the second floor of a five-story apartment complex. Meyler was found with her nightgown pulled up around her waist. Additionally, blankets covered Meyler's body and a pillow covered her head. She had several visible wounds to the right side of her head and in the right temporal area. A candelabra was found on the unoccupied, adjacent bed. There was blood spatter on the wall behind the beds. There was no forced entry into the apartment. The sliding glass window in Meyler's bedroom was open. The screen had been removed and was lying on the floor below. Her apartment was ransacked and left in disarray.

In September 2014, the blanket taken from Meyler's bed was analyzed. Semen was detected on the blanket and an unknown male DNA profile developed from the sperm fraction was uploaded to CODIS. On September 21, 2014, a CODIS hit was obtained. In January of 2015, a reference sample for the CODIS confirmation was obtained by detectives. The DNA profile obtained from the sperm fraction of the cutting from the blue and white blanket matched the DNA profile obtained from Harold Holman. In July 2016, Harold Holman (now 70 years old) was found guilty of the first degree murder of Helen Meyler. He was sentenced to life in prison. This presentation will highlight the legal issues and technical aspects of the case from the perspectives of the Criminalist and the Deputy District Attorney. The triumphs and challenges of working a 44 year old case will be discussed.

Integrating Trace Evidence Examinations at the NFI: Microtraces Materials group

Peter D. Zoon, Netherlands Forensic Institute (NFI)

Historically, trace evidence examiners have been generalists, with a broad knowledge of many different traces and materials. At the NFI, the rise of more sophisticated analysis methods has shifted the focus from broad generalist towards highly trained specialists, most of whom have expert knowledge of a specific type of trace (paint, fiber or glass). As Stoney and Stoney [1] mention in their paper, both approaches have their merits and drawbacks.

A recent change in organizational structure of the NFI has given rise to the opportunity to consolidate and integrate several trace evidence disciplines into a new group: Microtraces Materials. Within this group, every examiner and reporting officer is to have a broad general knowledge of all types of trace evidence handled within the group. It would, however, be a waste to ignore the highly specialized knowledge that is also available. Within the new group, several subject matter experts have been designated. These can be experts in a specific type of trace discipline (e.g. fibers) or in a specific analysis method (e.g. LA-ICPMS or SEM/EDX). This presentation will describe in more detail, the types of trace evidence, analysis methods, and the organizational structure of the new Microtraces Materials group of the NFI.

1. D.A. Stoney and P.L. Stoney *Forensic Sci. Int.* 251 (2015) 159-170
2. D.A. Stoney and P.L. Stoney *Forensic Sci. Int.* 253 (2015) 14-27

Evaluation of an Invertebrate Animal Model System for Determining the Adverse Effect Profile of Synthetic Drugs

Jay Vargas, California State University, Los Angeles

Determining the adverse effect profile of the ever increasing number of synthetic drugs reaching the street and encountered by law enforcement remains a challenge hindered by both ethical considerations for human consumption studies and cost involved with traditional vertebrate animal model systems. The freshwater planarian, an invertebrate flatworm, has recently been identified as an alternative pharmacological and toxicological screening system. In this study, method optimization parameters and the reproducibility of behavioral measurements using this system for synthetic cannabinoid drug exposures was investigated.



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fractions at various levels. Below is what I've come up with so far. No doubt there are categories I haven't thought of. Any additions or criticisms from you would be useful.

1. Broken glass particles. New: Broken glass from smart phones and tablets; (establish database) also used as a separation method for glass particles originating from different sources.
2. Pieces of rubber and plastic from automotive trim exchanged in hit-and-run vehicle accidents; (establish database) would include plastic from headlamp and turn and brake signal covers; also used as a separation method.
3. Glitter particles; (establish database) also used as a separation method.
4. (New) Shimmer particles from cosmetic products; (establish database) also used as a separation method.
5. (New) Single cloth fibers that are identical (same core such as cotton, nylon, rayon, etc.) but differ in having received (or not received) surface modifications; (establish database) also used as a separation method.
6. Pollen grains of various species; (establish database) also used as a separation method.
7. (New) Pollen grains from nanotagged cartridges (establish database) See: https://www.newscientist.com/article/dn14454-pollen-coated-bullet-could-make-its-mark-on-criminals/?feedId=online-news_rss20
8. (New) Small amounts of specific pollen grains or other nanotag-gants could be added (each batch would be different) to mold-release agents used in latex condom manufacture (establish database).
9. Metal flakes such as might be produced in machine shops or in the drilling of safes and locks; also used as a separation method.
10. Single-layer paint flakes that could be from various tools used in B&Es or from spray paint used by taggers.
11. Small fragments of various commercial sources of paper or plastic film; also used as a separation method.
12. (New) Individual nanotaggant particles used to mark for identification plants and animals in danger of being poached.
13. Individual artificial hairs from various commercial brands of wigs, hair extensions, etc. (establish database).
14. Individual fibers from faux fur from various commercial children's toys (teddy bears, etc.).
15. Individual particles from commercial thief-detection powders (Sirchie, etc.).
16. (New) Used as a way of separating human dandruff from assorted other debris. Subsequently, the Y-DNA (male) could be extracted and typed and compared to the DNA from suspects in sexual assaults and homicides where the victim and assailant had been in close contact. ISee M-VAC@ (www.m-vac.com/) and <https://www.bumc.bu.edu/gms/files/2013/03/Gunn-Thesis-Final.pdf>]
17. (New) Density of fly larva from species that commonly colonize dead bodies and at various growth period time intervals (adjusted for temperature/humidity/exposure), to provide support data for time of death determinations (establish database).

—Bob Blackledge

Establishing a Scientific Basis for Glass Fracture Matches

Bob Blackledge

In the publication *Strengthening Forensic Science in the United States: A Path Forward* (2009) page 47 “In testimony before the committee, it was clear that some members of the forensic science community will not concede that there could be less than perfect accuracy either in given laboratories or in specific disciplines, and experts testified to the committee that disagreement remains regarding even what constitutes an error. For example, if the limitations of a given technology lead to an examiner declaring a “match” that is found by subsequent technology (e.g., DNA analysis) to be a “mismatch,” there is disagreement within the forensic science community about whether the original determination constitutes an error. Failure to acknowledge uncertainty in findings is common: Many examiners claim in testimony that others in their field would come to the exact same conclusions about the evidence they have analyzed. Assertions of a “100 percent match” contradict the findings of proficiency tests that find substantial rates of erroneous results in some disciplines (i.e., voice identification, bite mark analysis).”

The below has to do with fracture matches, and in particular fracture matches involving pieces of broken glass. It would appear that the thinking that is evolving today among forensic scientists is that nothing can be said with absolute certainty to have originated from a specific source, be it blood, a fingerprint, a controlled substance, a paint chip, a torn piece of paper, a hair, a fiber, a footwear impression, toolmark, soil sample, etc. And this would be true regardless of the method/s used for characterization.

If we accept the thinking that nothing can be said with absolute certainty to have originated from a specific source, then the result of any comparisons between evidence from a Questioned Source and a Known Source can only be of value to the trier of fact if it includes likelihood ratios P_p/P_d [P_p = probability that the Q and K Samples originated from a common source; P_d = probability that the Q and K Samples originated from different sources]. P_p and P_d do not have to be exact, but they must have been calculated based on solid scientific data, and must include uncertainty approximations.

At present, only DNA comes close to meeting these requirements. To satisfy the requirements for other types of comparisons we would do well to follow the example of DNA. For example, using the Product Rule, P_p and P_d may be calculated, and regardless of how many different matching loci (and no non-matching loci) are included, a *random match probability of absolute certainty* would never be reached.

How must our thinking change? If comparing a fingerprint with a record print, we don't say that there has never been a substantiated instance where the prints from two *different* fingers were found to match. No, we treat every Questioned print as being a *partial* print. The partial print could range in detail from a single partial ridge with no bifurcations all the way to including ridge detail almost equal to the Record print. We could select certain features to count (the larger the clearly defined area of the partial print, the greater the number of features, and always with no non-matching features). Using the large AFIS database, we could see how P_p and P_d changed as in

small increments we enlarged the area of the partial print, thus exposing more features we could count. And as with DNA the *match probability* would never reach *absolute certainty*.

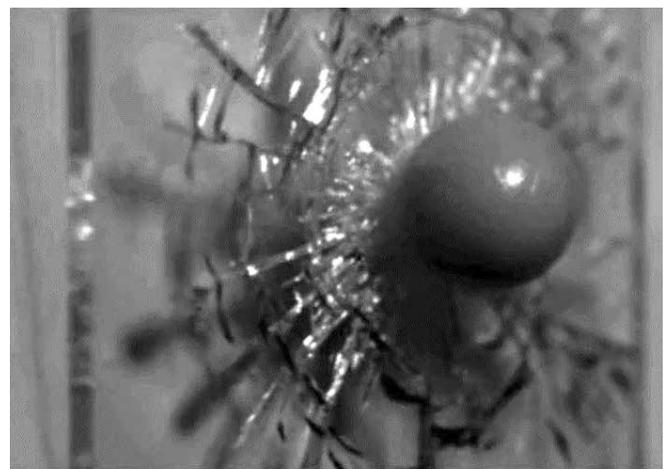
Now how could we apply this thinking to *glass fracture matches*? First I'll show how it *shouldn't* be done using the type of thinking used in the past. At www.ncjrs.gov/pdffiles1/nij/grants/241445.pdf you can find the report of the NIJ-funded study, Award Number 2010-DN-BX-K219, “Determination of Unique Fracture Patterns in Glass and Glassy Polymers.” Directly quoting the report's **Statement of Hypothesis**:

In this research, it is hypothesized that every fracture forms a unique and non-reproducible fracture pattern. Alternately, it may be that some fracture patterns may be reproduced from time to time. If it is found that each fracture forms a unique and non-reproducible fracture pattern, then this finding will support the theory that coincidental duplication of fracture patterns can not be attained.

However, if duplicate fracture patterns are found, this would falsify the null hypothesis and show that some fracture patterns may be reproduced from time to time.

Note that this research grant was awarded by the NIJ in late 2010, while “Strengthening Forensic Science in the United States: A Path Forward” was published in August 2009. Now, again read the Statement of Hypothesis but this time, every place you see “fracture” or “fracture pattern”, substitute “fingerprint.” This study is no different than what has been done with fingerprints in the past, except that the AFIS database is far larger (there were only 60 glass fractures and a total of 1,770 pairwise comparisons). And so what if all the glass fracture patterns were unique? There is never any forensic reason to compare two or more entire glass fracture patterns. Only a broken shard of some length is compared with an edge area on another broken shard. The results of this study are a total non sequitur if the question asked is the match probability that an edge region on the Questioned glass shard was at one time contiguous with an edge region on the Known glass

Do a Google search and enter “slow motion videos of glass breaking” you will get many hits. One of the best is “Breaking glass looks insane in slow motion.”



YouTube/Shimadzu

shard? The study results do absolutely nothing to put fracture matching of glass on a more scientific basis. What could the anonymous panel members (supposedly all experienced and highly-regarded scientists) have been thinking when they decided to fund this research proposal?

There is a reason why I'm so interested in glass trace evidence. In the past, most glass fracture matches involved broken windows, bottles, or pieces of headlight glass in hit-and-run accidents. Today we have a new source of broken glass. I'm talking about the cases and screens of smart phones (example – Gorilla Glass & Sapphire Glass). Such broken glass exchanges could occur in rapes and fatal assaults (example – victim is desperately trying to dial 911 when the assailant knocks the phone out of her hand and the case and/or screen shatters and broken glass fragments fly everywhere). In such serious crimes it will not be sufficient to just use density and refractive index determination and optical emission spectroscopy to compare the Questioned and Known samples. And just as kids have been murdered just for the expensive Air Jordan® sneakers they are wearing, the same thing will likely happen in order to steal their expensive smart phones and tablets, and in the fracas it's likely the phone or tablet will drop and land on a hard surface with the case or screen shattering with tiny pieces of this tempered glass flying everywhere.

Okay, it's easy to sit back and criticize the ideas and/or work of others. My personal philosophy is it isn't ethical to criticize unless you are willing to expose yourself to criticism by offering up what you feel is a better way. So how could we come up with a way of arriving at a fracture *match probability* between a Questioned glass shard and a Known glass shard? There are likely a number of ways this could be approached, but my own thinking (backed by a subsequent literature search) is to use fractal analysis. "Fractal analysis is based on fractal geometry and is a mathematical tool that can be used to identify the toughness of materials as well as the creation of order out of seemingly complex fracture patterns." (Varner, et al, 2012) Although it would seem that forensic scientists are unaware of fractal analysis, it has found use in other scientific areas, especially those related to geology. The problem is that scientists in other areas have no interest in the question: "What is the probability that these surfaces were previously contiguous?" So the mathematics of fractal geometry would have to be modified. Also the math would need to take into account a range of touching surfaces anywhere from contact by single opposing grains up to contact lengths of several centimeters. I would assume that at the very shortest contact lengths the probability of a unique match would be low and that with increasing length and increasing surface roughness of a fracture the match probability would increase but would never reach absolute certainty.

Is it likely that some method of fractal geometry will be able to prove by scientific methods that a surface on the Q glass shard forms a "perfect" match with a surface on the K glass shard? No! The best that we can hope for is to come up with a figure of the extent that Q and K "mismatch." The extent of the mismatch will depend on the wavelength chosen for comparing the two surfaces. If too small a wavelength is chosen there will likely be many mismatches even if previously the two surfaces were contiguous. Selecting a larger wavelength will tend to smooth out any tiny mismatches and end up with a figure indicating a closer match. (Glover, 1998)

How can I state without fear of contradiction that there will be no "perfect" glass fracture matches?

If you zoomed in close, with a black background, and a dark room, with a light beam coming in from the side, and made a video of glass breaking in super slow motion, what would you see? If the glass was regular soda lime glass, or if it was tempered glass from the screen of a smart phone, you would see the glass break into numerous shards. But at the same instant that you saw the glass breaking into numerous shards, you would also see a fine mist of tiny glass particles originating from the fracture lines producing the larger shards. If your slow motion video was so good and could be stopped and frame-by-frame advanced so that you could follow two shards that had been contiguous and then retrieve them and see if you could fit their edges and show that they had been contiguous, you would not get a "perfect" fit! Why not? Well duh, from where do you think that fine mist of tiny glass particles originated? That's why if in your fractal geometry calculations if you choose too small a wavelength (say about the same as or smaller than the tiny glass particles in the fine mist) your fractal geometry calculations will indicate a poor fracture match. If you are in fact comparing a true fracture match then as you step-wise increase the wavelength your closeness of match figures should get better until you've passed the optimum wavelength. Experimenting with glass of known type and thickness and using numerous glass shard pairs you knew had been contiguous and also glass shard pairs you knew had not been contiguous you would gradually be able to approach match/no match figures where you were confident a Q shard and a K shard had been contiguous and could calculate P_p and P_d , and could in court state and explain your findings with confidence.

If you do a Google search and enter "slow motion videos of glass breaking" and then when the search results come up you select "videos," you will get many hits. One of the best is "Breaking glass looks insane in slow motion" at www.businessinsider.com/breaking-glass-in-slow-motion-gifs-2015-4.

References

- Strengthening Forensic Science in the United States: A Path Forward www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf
- Varner, J. and Wightman, M., Fractography of Glasses and Ceramics VI: Ceramic Transactions, Volume 230, pp. 147-160, Chapter title: Failure Analysis of Ceramic Laminates Using Quantitative Fractography and Fractal Geometry, J. J. Mecholsky, Jr., Dept. of Materials Science and Engineering, College of Engineering, University of Florida.
- Glover, P., et al, Synthetic Rough Fractures in Rocks", *J of Geophysical Research*, Vol. 103, No. 85 pages 9609-9620, May 10, 1998.

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