

The President's Desk

A Thoughtful Feast

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CAC President

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I was aware of my
cognitive bias, I did not
think much of it until my
discussion with my cousin.
My normal wasn't my
cousin's normal.**

Greetings Fellow CAC Members,

Where did the time go? Half of the holiday season has come and gone. I hope all of you were able to get in at least one good deal somewhere on Black Friday and/or Cyber Monday.

It was, as per usual, a bountiful Thanksgiving for me. This year, the Tan/Tanns from near and far got together at my house. My cousin, Vuthy, who is from the East coast, cooked not just one, but two turkeys, AND a ham. I am NOT as skilled as my cousin in and around the kitchen. My contributions were garlic mac and cheese, and spinach dip using Knorr's trusted vegetable mix. I am proud to say, both dishes were a success!

However, it was an unusual Thanksgiving this year for my family. Unusual, you might be thinking? What's so unusual about turkey, ham, mac and cheese, spinach dip, pecan pie, apple pie AND pumpkin pie??? That's as traditional of an American Thanksgiving menu as one can get. It's traditional and normal for an American Thanksgiving, but not so traditional for this California Asian American. Our Thanksgiving menu normally consists of roasted pig, Hainan chicken, fish maw soup, a stir fry dish, and other Asian favorites....with rice, of course. That has been my normal for many years. It has been my expectation. It's my cognitive bias regarding Thanksgiving dinner. Granted, I knew that this menu was not the norm with most Asian American families, much less American families.

Vuthy grew up in Rhode Island, had "normal" Thanksgiving dinners and white Christmases. He thought it was odd that my Thanksgiving menu did not include turkey. I told him that it just didn't. Although subconsciously, I was aware of my cognitive bias, I did not think much of it until my discussion with my cousin. My normal wasn't my cousin's normal.

The same could be said about our work in forensics. Perhaps being aware of our cognitive biases is not enough? Perhaps the more discussions we have regarding our cognitive biases will help to bring the subject from our subconscious to the forefront? About a year ago, most of us at DOJ-BFS were asked to take a cognitive bias class. My takeaway from the class was that we need to be more aware that there is inherent bias in all of us on many subjects. Hopefully this piece helps to start the conversations and assist us in our daily jobs, routines and/or interactions.

More agencies are sending their analysts to cognitive bias training; therefore, I believe forensic science is moving in the right direction with respect to the understanding, recognition and awareness of our cognitive biases. I hope and wish the same for society in general. Christmas and 2019 are fast approaching, which means I am halfway through my term as CAC president. I hope to do more, be a positive force for CAC and represent forensic science well in the second half of my term and in the future. I would like to thank my fellow Board members and committee members. The CAC would not be where it is without all your efforts and dedication. I would also like to thank CAC members for your continued support. It's been said, it takes a village to raise a child. Well, it takes great members to make a great CAC.

Happy Holidays to you and your loved ones!

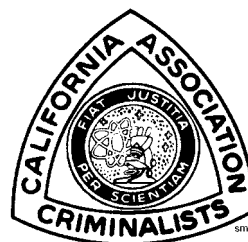
Warmest regards,

Mey

FIRST QUARTER 2019

The CACNews

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Kenya Thomas and Eric Yan-Hung Yu watch as Steve Lee sets up their poster at the Fall CAC in San Diego. More photos inside.

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.

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

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ROBINSON



CAC Editorial Secretary

In her presentation, Jamie notes that she found only two research papers on the topic of stress experienced by bench-level criminalists.

Workplace Stress

This editorial is inspired by a presentation at the last CAC Seminar by Jamie Lajoie entitled “To stress or not to stress: Evaluating stress in forensic science.” During the seminar she disseminated a survey to assess the stress levels among the criminalists in attendance and the multiple sources contributing to stress. Ninety-six surveys were completed and the results were presented during the general session and shared here in this issue of the *CACNews*. I am anticipating a follow-up evaluation from Jamie to be published in an upcoming issue, so I’ll leave the additional survey details for her to expand on.

However, I did want to share some of my thoughts regarding the aspects of this topic I found most interesting. In particular, I thought it interesting that very minimal research has been conducted on how our work in forensic science impacts our mental health, specifically stress levels.

In her presentation, Jamie notes that she found only two research papers on the topic of stress experienced by bench-level criminalists. One in particular, “Examination of the Conditions Affecting Forensic Scientists’ Workplace Productivity and Occupational Stress”¹ examines the sources of stress and their impact on criminalists’ productivity and work product. Holt et al. attributes occupational stress among forensic scientists to three main sources: the number of hours worked each week, the lack of supervisory support, and role conflicts. The research is thorough and offers valuable information to readers of all levels of the crime lab, from trainees, bench workers and management. This study provides extensive background information about work-related conditions and factors that may lead to stress and validates the emotions that many of us feel from time to time.

I think the most valuable part of this research, aside from reassurance that everyone is experiencing similar workplace challenges, are the suggested policy changes that management can implement. Some suggestions from Holt et al., which may mitigate stress that forensic scientists experience, include:

- Identifying ways to more equitably distribute overtime hours across scientists.
- Developing flex hours or shifts that are more convenient for scientists working extensive overtime.
- Establishing clear lines of communication both up and down the chain.
- Use of open staff meetings where management is present helps to increase communications between scientists and management, and generally promote support for the scientific staff.
- Clear communication of justifications for supporting or denying equipment and training requests would be valuable in demonstrating the reasoning behind managerial decisions and eliminating perceptions of detachment or a lack of concern for scientific productivity.
- Establishing clear expectations and procedures for employees which may lower individual levels of stress and increase job satisfaction by ensuring that individual work roles are understood and achieved daily.
- Encouraging scientists to minimize noise distractions, ensure that adequate storage and equipment space is available, and give flexibility to staff to ensure that they are working in optimal conditions for both safety and productivity.
- Encouraging scientists to report when they experience symptoms of secondary trauma or have any concerns about physical health.

While this study provides a good foundational assessment, it recognizes that more research is needed to investigate further the demographic factors among criminalists that may be associated with stress levels. The only significant demographic factor determined in this study was that women experienced higher levels of stress. Additionally, more research is needed to identify and fully understand the workplace factors truly unique to criminalists which contribute to stress and decreased productivity as opposed to general factors applicable to all those in criminal justice field.

From the discussions that occurred as a result of this presentation and the conversations that I engaged in during the seminar, it's obvious that criminalists want to talk more about this. The feedback was overwhelmingly positive and I'm hoping this engagement continues. We need to actively participate in this research in order to understand and therefore improve our workplace. I encourage all of you to review Jamie's presentation and survey findings and to read the research by Holt et al. And as always, your thoughts are welcome here.

As 2018 winds down, I wish you all a happy and healthy holiday season. The holiday season, although festive and fun, can also mean that our personal lives and schedules are a bit hectic and stressful. I hope this topic inspires all of you to reflect on both your personal and workplace conditions and seek ways to mitigate any stress that you may be experiencing. Personally, this has been a trying last quarter of the year. And even while I dream of a white Christmas, I will be working on my own personal goals towards betterment and rejuvenation, and continuously striving to strike a healthy balance.

Cheers,

Mei

To Stress or not to Stress:

Evaluating Stress in Forensic Science

from a PowerPoint Presentation by Jamie Lajoie

Scientists in the study reported moderate level of work stress and slightly higher levels of satisfaction than those reported by other criminal justice employees, as well as those working in the helping professions.

The most frequent cited self-reported stressors at work including larger workloads, extended case backlogs, and difficulties with upper management.

Many scientists indicated that they accomplished worthwhile goals and contributed to public safety through their work. They derived a great deal of job satisfaction through helping victims, the community, and the falsely accused by discovering the truth through scientific investigation.

In addition, a substantial proportion of respondents felt that they had good working relationships with the court system and had good managerial support within their workplace.

Scientists working a greater number of hours, each week reported greater levels of stress, as did those who felt less support from their supervisors, management and court actors.

Women are more stressed than men (same as sworn). This could not be explained and needed more research.

Scientists who reported high levels of work stress and low job satisfaction were more likely to report negative behavioral and psychological consequences outside of the workplace.

Those under stress were more likely to experience trouble sleeping, irritability or outburst of anger, difficulty concentrating, a constant feeling of alertness, and being easily startled. Thus, this suggests secondary trauma symptoms can manifest in forensic scientists through their exposure to the physical evidence produced by criminal events.

Scientists reported a range of coping strategies to deal with work stresses, the majority of which are considered positive for their mental health.

Respondents reported to trying to forget about it, finding an activity to take their mind off things, and talking things over with a spouse or significant other. More than half indicated they would work harder around the house or on the job or talk things over with friends

Under 10 percent reported consistently utilizing professional counselors or therapist. (Which was consistent with police officers)

Scientists reported infrequent use of negative coping mechanisms.

45% said they would at least sometimes have a drink to help them cope with work experiences (similar to other criminal justice professionals)

Management: Looking at number of hours worked, equally distribute overtime hours, developing flex hours or shifts (enable scientists to better manage demands from home and personal lives; Clear lines of communication; Clear expectations and procedures for employees and carefully revised staffing plans and written policies to help reduce redundancy and diminish the likelihood of role conflicts. Management should promote awareness of signs of emotional stress or secondary trauma among the scientist in their laboratory.

Survey Metrics

96 Surveys Completed, 28 Men And 68 Women

Disciplines: 54 DNA (56%), 6 Firearms, 4 Trace, 3 Tox, 12 Drugs, 2 QA, 1 Digital, 2 BA, 2 CSI, 0 QD, 1 Latent Prints, 9 Did Not Specify, 41% respond to crime scenes.

AGE: 20-30 25%; 31-40 35%; 41-50 22%; 51-60 6%; 60+ 4%; N/A 6%

Experience (yrs): <5 15%; 5-10 30%; 11-20 40%; 21-30 7%; 31+ 6%; N/A 1%

Public	92%
Private	2%
Indep.	0%
Retired	2%
Student	1%
N/A	3%

Q4: I usually feel that I am under a lot of pressure when I am at work.

Agree	33%
Neutral	46%
Disagree	22%

Q5: When I am at work, I often feel tense or uptight.

Agree	26%
Neutral	38%
Disagree	38%

Q6: Working with difficult images/scenes/cases all day is a real strain for me.

Agree	11%
Neutral	32%

SURVEY, cont'd

Disagree 56%
NA 1%

Q7: *I feel frustrated by my job:*

Agree 21%
Neutral 30%
Disagree 48%

Q8: *All in all, how satisfied are you with your job?*

Satisfied 85%
Neutral 10%
Not Satisfied 4%

Q9: *In general, how well would you say your job measures up to the sort of job you wanted when you took it.*

Not very much like the job I wanted 7%
Somewhat like the job I wanted 29%
Very much like the job I wanted 52%

Q10: *The managers in my agency are responsive to my thoughts and suggestions.*

Agree 51%
Neutral 26%
Disagree 25%

Q11: *The managers in my agency are mainly concerned with getting cases out the door.*

Agree 53%
Neutral 29%
Disagree 16%

Q12: *I regularly feel I am behind in casework which causes me stress.*

Agree 27%
Neutral 36%
Disagree 34%

Q13: *I have had nightmares from things I see or encounter at work.*

Yes 17%; No 83%

Sub category:

27.5% of personnel who do crime scenes responded yes to this question.

Q14: *I worry about my personal safety when:*

Responding to crime scenes 14%
Responding to court 5%
A and B 13%
None of the above 67%

Q15: *If needed, I would feel comfortable seeking out a mental health professional due to work related issues.*

Yes 80%; No 18%

Q16: *My management is supportive of me seeking out mental health professionals due to work related issues.*

Yes 55%
No 9%
Don't know 35%

Q17: *Sometimes stress in my personal life (ie. divorce, sick child, etc.) has caused me to be less effective in my job.*

Agree 59%
Neutral 23%
Disagree 14%

Q18: *The most stressful part of my job is:*

Completing case work on time 11%
Responding to crime scenes 3%
Testifying in court 26%
Interacting w/difficult co-workers 33%
Management not being responsive to my opinions 14%
All of the above 6%
None of the above 8%

Comments:

Take things more professionally than personally

Management doesn't have a full understanding of job function

Would like management to offer active stress management activities

Having the wrong supervisor or difficult co-worker can happen anywhere but with the other stresses in this job, those can be magnified

Mental stress is a cancer in this field

I dislike my job but love what I do (can't wait to retire)

Keeping up with accreditation, CARs and proficiency test is stressful

Employees with poor ethics

Miscommunication between supervisors and management causes mixed messages that can be stressful and they can have conflicting goals

As a manager: meeting the needs of clients, are my employees stressed?, do they have the correct training?, managing money and managing conflicts with co-workers

CO-WORKERS!

Perfection is an expectation. Help with testimony and communication with sworn personnel would be good.

Politics of management causes stress

Management style of negative reinforcement causes the most stress

Lack of communication with the DA's office

Positive Comments:

New but feel I have a good support system!

Fortunate to have supportive supervision and have a good outside life

Very little stress

I am very lucky to work at my lab because of the support we have with lab management

Our agency proactively engages in the department's mental health division

If I assign myself reasonable set of cases in a reasonable set of time, the stress is reduced. For court I allow myself dedicated time to study and testimony is smoother

Thanks!

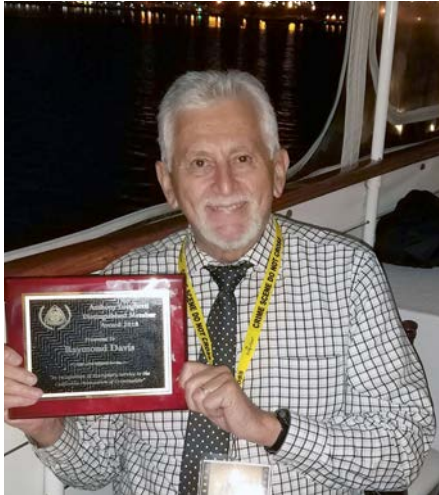
CAC, Eucen Fu and Survey participants

Raymond J. Davis

Anthony Longhetti Distinguished Member

On the occasion for receiving the most distinguished member award, I would like to share a life's principle for success, then a short thanks and finally a shout out to those that had a major influence on my career.

First, I give thanks every day to God for all His under-served kindness. To my wife who I lost one year ago for all the love, support and encouragement she showed me during our



42 years together. She stood behind every decision I made in my career choices that often brought her grave concerns about my sanity. And like a good Viking, she just soldiered on. Her most notable contributions came through the advice she provided to the courtroom training classes I taught over the past 27 years. She

attended 42 classes offering ideas and suggestions to better present the material to the students. Many people loved having her in the class no one more than me. It was a joy to work with her. Finally, to the CAC Board of Directors for this very special award, I am deeply honored.

Next, I want to share a life's principle that has brought me both wealth and satisfaction in my life. I learned this principle at a very young age from my mother. I can still hear her voice telling me, "It's not enough to complete a task I give you but that you have to also do something more." Why I asked in confusion. She added, "That little extra will make someone else's life a little easier." I didn't understand the payoff for me but I trusted her wisdom. She also added that by following this principle I would get 'more' out of any effort I made. There were also personal gains to be made through this principle as well. Her wise counsel was reinforced by a quote from a famous WWII general, George S. Patton who said, "Always do more that is required of you." That quote is affixed to my computer screen reminding me every day to do more at whatever task I was assigned. Even if I gave myself the task. Let me give two examples of how this principle provided countless benefits in my personal life and in my career.

I was drafted into the US Army after completing two years of college in 1967. One day I'm a student working at Memorex in Sunnyvale, CA and the next day, I'm wearing camo with a quarter inch of hair. I was required to serve two years and then return to civilian life. Using my principle, I asked myself, 'what is the one thing I can do 'more than' while serving in the Army. Several opportunities presented themselves and I chose to become a second lieutenant through Officer Candidate School at Fort Benning, GA. By making that decision, it meant

spending an extra year in the service while taking on greater responsibilities as an infantry platoon leader, then executive officer and finally a stint as a brigade staff officer. After leaving the service to return to college, I joined the California Army National Guard and made captain commanding the 270th MP Company in Sacramento, CA. Those decisions continue to pay great dividends to this very day. After six years, I felt that I had done more than was required of me and grew my hair long and started a beard. The first one in DOJ by the way!

Another example of this principle in my career came after seven years when I decided to do something about the lack of training in courtroom testimony. My first training in testifying started with DOJ and lasted less than 60 seconds. I can still recall it: "Wear a coat and tie, get to court on time, tell the truth, don't argue with the lawyers and get back to work." Not much to work with. As a result of this inadequate training, I became a terrible witness. I got tired of being battered around and often appeared as an angry witness to jurors and lawyers alike.

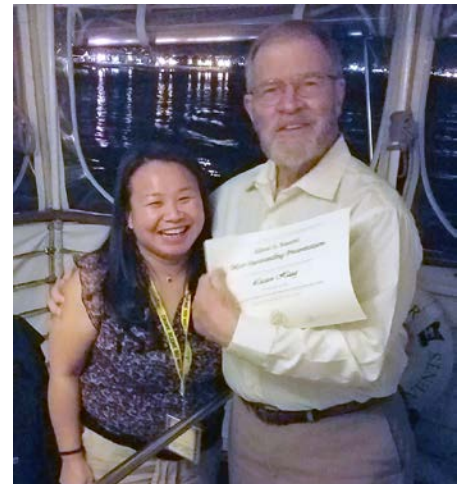
I felt compelled to something about this problem. I would spend many years and many thousands of dollars creating a class I taught in 1988 in Washington State. Then in 1991, Lou Maucieri, then at the California Criminalistics Institute with DOJ, asked me to submit a proposal to teach a three day class called, 'Courtroom Presentation of Evidence'. He sent this request to numerous other companies and agencies across the U.S. and I was the only one who responded to his request. From that first class in 1991 to the most recent one at the Santa Clara County Crime Laboratory, I have taught 265 classes and twenty two workshops to over 6,500 students in 17 states including Washington, DC.

Last, my shout outs to those friends and colleagues who have had a huge influence on my career. In no particular order: John Houde, Jerry Chisum, John Murdock, Lou Maucieri, Lance Gima, Bruce Moran, Al Biasotti, Fred Wynbrandt, Peter Barnett, Celia Hartnett, Joe Rynearson, Cristian Orrego, Luke Haag, Grady Goldman, Keith Inman, and finally to my first lab partners, Bill Corazza and Mike Waller. We started the San Rafael DOJ lab in 1972 together, just the three of us. We didn't even have a secretary and had to hire our own. We hit the jackpot when we interviewed and hired Mila Bolotoff who treated us like her children and we loved her. The three of us shared two things in common: being Army veterans and chemistry majors. We clicked from the git go. Half the time we had to make things up because there wasn't any SOP or guidelines for running a small lab. The other half of the time, we traveled to all the law enforcement agencies in our 5 county areas drumming up business. It was an exciting time. I still marvel how we managed it all. My final shout out goes to all those who attended the courtroom classes I have taught over the years. Your contributions, and there were many, helped to shape the course material making it a joy to present the material.

Well, this is the speech that I would have liked to have given at the last CAC seminar. But doing so on a dinner cruise didn't seem appropriate. I have found that giving thanks has brought a sense of gratitude and humility to my life; a valuable asset for an expert witness. My life's principle which has become an integral part of my life has brought a greater purpose and meaning to my life. And finally, by acknowledging the shoulders of those whom I have stood upon have made me realize that my success in life does depend on the contribution of others and I'm privileged to say their names.

Thanks everyone.

—Raymond Davis



Awards

(top l) Chad Eyerly received the Edward F. Rhodes III Memorial Award and Melissa Moore the Paul Kirk Presidents Award. (center) Jennifer Mihalovich received a certificate for serving on the Ethics Committee. Other certificates were awarded to Jamie Lajoie (Southern DNA Workshop Study Group Chair), Meghan Mannion Gray (Seminar Planning Committee Chair), Shelli Perez (2017 Most Outstanding Presentation:) "Marijuana Trends." (top r) Lucian Haag poses with CAC President Mey Tann with his 2018 Alfred A. Biasotti Most Outstanding Presentation Award for, "Trace Evidence on Bullets: Its potential importance and reconstructive value." Naomi Weisz won spring 2018 Best Poster Award: "Reliability of Phenotype Estimation and Extended Classification of Ancestry for Forensic Application." Jennie Smythe received a certificate for serving on the Financial Review Committee. Also receiving plaques were Kristin Beyers and Lisa Merzowski as Seminar Co-Chairs for the Fall 2018 meeting.



Your CAC 2018-9 Board of Directors hard at work

(l-r) Regional Director (North) Cindy Anzalone, Recording Secretary Gunther Scharnhorst, Treasurer Helena Wong, Immediate Past-President Vincent Villena, Regional Director (South) Jamie Lajoie, Membership Secretary Megan Caulder, Editorial Secretary Meiling Robinson, President Mey Tann and President-Elect Alice Hilker.

ABSTRACTS

FROM THE

FALL 2018 CAC SMINAR

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DNA SESSION

Snapshot Advanced DNA Analysis

Steven Armentrout - Parabon Nanolabs

Police investigators are leveraging new DNA technologies in a very different way in an attempt to solve cold cases. The use of DNA to provide an idea of the physical characteristics of possible perpetrators or to obtain genealogical information that could potentially identify the family tree of the perpetrators is gaining traction and interest. The presentation will provide an overview of the technology and how it is being used with public domain genealogy sites to provide investigative leads that have resulted in some high profile breakthroughs in cases that have long been cold.

Status of NGS testing in Forensics

Jodi Irwin - Federal Bureau of Investigation

Massively parallel sequencing (MPS) is an established technology with the ability to dramatically increase the amount of information obtained from the analysis of evidence in criminal and missing person's cases, but what is the status of that technology for forensics. This presentation provides an overview of the technology, the kits available, which labs are using it currently or are planning on using it in the near future. In addition, the presentation will address the status of standards for MPS from SWGDAM.

DNA Analysis of Degraded Skeletal Remains Using an MPS Workflow

Kristi Kim - Verogen FAS

The analysis of skeletal remains continues to present a significant challenge to forensic laboratories due to the typically low yield and highly degraded state of DNA content. Historically, laboratories have leveraged well characterized sanger-sequencing based mtDNA analysis methods, but the associated processes are labor-intensive and place an exceptional strain on resources, while providing a fraction of the data that can be mined with more contemporary technologies.

Recent improvements in upstream extraction methods and quantification chemistries, coupled with massively parallel sequencing (MPS) technology, collectively increase the likelihood of obtaining informative nuclear DNA profiles from challenging samples. The application of MPS can also significantly reduce the hands-on labor and time investment required by forensic analysts to sequence challenging samples, liberating them to focus on and optimize other areas of their workflow, such as sample preparation and data interpretation.

QAS Update

Jocelyn Carlson - Federal Bureau of Investigation

SWGDAM is currently working on the update to the Quality Assurance Standards for DNA Testing Laboratories as well as for DNA Databasing Laboratories. This presentation will seek to provide an overview that can be expected in

the new standards and an explanation behind the changes. In addition, the timeline for implementation of the new standards will be discussed.

OCCL DNA Transfer Study

Danielle Weiland - OCCL

This presentation will provide a summary of the results of the Orange County Crime Laboratory's study on touch and transfer of DNA. Topics like DNA transfer rates, DNA persistence will be discussed as well as the potential implications on the meaning of DNA results.

STRmix Implementation Triumphs and Woes at the Los Angeles County Sheriff's Department

Learden Matthies and Gregory Hadinoto

The LASD Crime Laboratory has recently validated and implemented STRmix software for casework. After approximately three intense months adjusting to the new interpretation method, some lessons have been learned and improvements have been made. This presentation highlights some notable aspects of training, challenges encountered in casework, reporting results and software related issues.

OCCL's Informed Mx priors and Drop-in Studies for STRmix

Jennifer Jarrett - OCCL

User Informed Mx Priors is a setting in STRmix that can be used to preset the mixture proportion prior to running a deconvolution. This setting is useful for mixtures where the mixture proportions and genotype weights are counterintuitive, such as in mixtures with relatives and mixtures with a low level, trace contributor. This presentation will demonstrate how the OCCL validated User Informed Mx Priors and will go over the drop-in study that was performed during the validation of STRmix.

Legal Admissibility of Probabilistic Genotyping Software

Chris Lindberg, Office of the District Attorney, San Diego County

The recent and on-going transition of forensic crime labs to probabilistic genotyping software such as STRmix and TrueAllele has led to challenges regarding the legal admissibility of such evidence in criminal prosecutions.

Courts have long employed legal tests to judge the admissibility of scientific evidence. In the federal court system and many states, such challenges are examined using the *Daubert v. Merrell Dow Pharmaceuticals, Inc.* [Daubert] standard, while in California and a few other states the test set forth in *Frye v. United States* and later *P. v. Kelly* [Kelly-Frye] is used.

The two tests are different. Under *Daubert*, the judge is the gatekeeper and decides whether the testimony truly proceeds from scientific knowledge and is relevant and reliable. Under *Kelly-Frye*, the judge decides the reliability of new or novel scientific procedures by examining whether it is generally accepted in the scientific community. The Court will also examine whether the witness is qualified and the correct scientific procedures were used. Appellate Court review these rulings de novo and a published case from a court of appeal will then be binding precedent in the trial court.

At the present time, there are no such decisions. In California, the recent *Kelly-Frye* hearing and subsequent conviction in *People v. Littleton* [Littleton] may provide the Court of Appeal a chance to rule on this issue with regard to STRmix using the *Kelly-Frye* test. There is reason for some optimism

ABSTRACTS, *cont'd*

as more forensic laboratories adopt probabilistic genotyping software and it becomes easier to demonstrate general acceptance in the scientific community.

This presentation will cover the differences between the *Kelly-Frye* and *Daubert* standards, discuss the extensive hearing conducted in *Littleton*, and offer some thoughts on what the future may hold for probabilistic genotyping software vis-à-vis its use in forensic DNA testing.

GENERAL SESSION

Fundamentals of Terrestrial Laser Scanning

Dietrich Evans-Leica Geosystems, Inc.

The widespread adoption of 3D laser scanning for crime scene investigation is fundamentally changing how investigators approach crime scene documentation and the output they provide to prosecutors. Laser scanning allows users to quickly and easily capture millions of extremely accurate 3D measurements along with vivid color panoramic photography. In minutes investigators can create detailed and interactive 3D “rapid response products” enabling detectives and command staff to understand the scene far sooner and in far more depth—all without visiting the crime scene and risking contamination. The technology permits amassing a complete record of a scene, not just the subjectively selected “important” points. Determining “who could see what from where?” by introducing witness viewpoints into a 3D scan scene can quickly help to corroborate or disprove witness statements. Powerful shooting reconstruction tools allow bullet trajectories to be virtually extended from ballistic impacts out into the larger scene for shooter positioning. In the courtroom 3D laser scanning exhibits have been widely credited with countering the so-called “CSI effect” by allowing prosecutors to place the jury into the crime scene via a fully immersive 3D environment.

Cannabinoids: Prevalence and Stability Studies

Vanessa Meneses - Orange County Crime Lab

As the need for Cannabinoid testing increases, there is often question about which of these compounds are important to consider when developing a testing panel. Prevalence and stability of these compounds can be a part of that decision. Two studies were conducted at the Orange County Crime Lab - one to evaluate the prevalence of Cannabinol (CBN) and Cannabidiol (CBD) in casework, the other to evaluate the stability of five cannabinoids in different storage conditions. All casework and research samples were extracted by automated vacuum manifold on a Tecan Freedom EVO 200, and analyzed by LC-MS/MS on a Waters Acquity UPLC with HSS T3 column. The prevalence of CBN and CBD in postmortem samples and antemortem driver samples (LOQ = 1 ng/mL) from 2016 were compared. Both drugs were detected in less than 3% of each sample type. It was concluded that this may be due to actual low prevalence among samples, or due to the stability of the compounds and time to analysis. Stability was evaluated for all five cannabinoids currently analyzed in the laboratory; Δ^9 -tetrahydrocannabinol (THC), 11-hydroxy-THC, 11-nor- Δ^9 -carboxy-THC, Cannabinol (CBN), and Cannabidiol (CBD), antemortem and postmortem blood were spiked at varying concentrations and stored in refrigerated (4°C) and frozen (-4°C) conditions. For a six month period samples

were repeatedly analyzed, in triplicate, without evaluating the freeze-thaw cycle. Antemortem samples were more stable when refrigerated while postmortem samples were more stable when frozen. THC and CBD tended to be the least stable of the cannabinoids despite sample type or condition.

Chemistry of Toxicology and Controlled Substances in OC

Cody Woltz - Orange County Crime Lab

Drugs trends are constantly evolving, leaving Forensic Toxicology and Controlled Substances/Solid Dose sections scrambling to keep up in their ability to detect new drugs. Integration and information sharing between these Forensic Chemistry sections is critical for the identification of new and emerging drug trends. There are also many sources of information available online detailing new and emerging drug trends that can keep chemists prepared prior to the drug's arrival in the lab. The integration between Forensic Chemistry sections at the OCCL will be discussed including examples of casework conducted.

Identification of Cocaine in Plastic Container Using Confocal Raman Micro-spectroscopy

Sergey Mamedov - Horiba Scientific

This study describes the application of confocal Raman microscopy to the detection and in-situ identification of cocaine in plastic container. In this research, we collected the Raman spectra of cocaine using 632.8 nm and 785 nm laser excitations. Some particles of cocaine show fluorescence background, which may be reduced by decreasing the size of confocal pinhole and/or subtracted. We collected Raman spectra of the particles trapped on the inner surface and the particles located far away from the surface of the plastic bag (case material). The method of analysis is likewise described.

Despite the presents of spectral bands arising from plastic bag, confocal Raman micro-spectroscopy allows one to identify cocaine by its characteristic Raman bands.

Refuting mutual combat through bloodstain pattern analysis

Stephanie Lambert - San Diego Police Department Crime Lab

A presentation of crime scene reconstruction involving bloodstain patterns which lead to the conclusion that the evidence was inconsistent with the defendant's claim of mutual combat

A System Approach to Product Development: How your “asks” during expanded multiplex kit adoption drive our “answers”

Jill Muehling - Thermo Fisher

For over 25 years Applied Biosystems has been listening to valuable customer feedback surrounding the ever-evolving needs of the forensic community. In the last few years as labs worked to bring expanded multiplex kits online a new set data interpretation challenges arose. Labs have been asking for ways to decrease analysis time, increase confidence in resultant data, and for a more efficient processing workflow.

The evolving needs of the forensic community and YOUR input have culminated in the latest advancements to 3500 Data Collection and GMID-X analysis software.

Pull-up reduction, off-scale data recovery, and added flexibility are just some of the features 3500 Data Collection v4 has to address YOUR needs for efficiency and decreased

analysis time. Based on your input, Win10 compatibility and better integration with Probabilistic genotyping SW lead to a GMID-X v1.6 that has been improved to streamline data export and support the new DC features.

Imagine what you could do with the time saved on data analysis and increased first pass success rates. To learn how this partnership can enable YOU to get from sample to answer faster, join us for this informative talk about our newest software releases.

The Modern DNA Intelligence Landscape – End of the “Cold Case” as we Know it?

Cydne Holt - Verogen

Traditional DNA profiling combined with offender database searching has proven to be invaluable in generating investigative leads in “no suspect” cases, as evidenced by the more than 424,000 investigations aided nationally by CODIS as of September 2018 (1). However, there remains a significant number of unsolved cases with biological evidence that fail to yield “up-loadable” profiles or actionable CODIS database “hits” using these methods.

This has led to the exploration of alternative approaches intended to obtain additional useful data and actionable intelligence in these cases. These approaches range from “familial searching” (in jurisdictions where this is allowed) to the use of modern molecular biology advancements such as massively parallel sequencing (MPS, also known as next generation sequencing) to reveal more information from evidence samples, i.e. unique identity information as well as estimation of physical characteristics in a single test.

Options for generating genetic investigative leads can now be considered across a continuum of value from “little” to “unlimited.” On one end of the spectrum is traditional DNA typing (STRs) by capillary electrophoresis, which provides no additional intelligence besides gender. On the other extreme is sequencing of the whole human genome. In between are validated solutions for targeted analyses of forensic STRs & SNP loci by MPS, along with use of data from “direct to consumer” (DTC) enterprises that produce dense SNP typing on microarrays, and are available for searching online against unknown crime scene evidence. This latter type of investigative lead, approached via “forensic genealogy,” may be considered as “long-range familial” searching, in a non-CODIS environment.

This presentation covers the expanded DNA intelligence landscape from the technical perspective of the forensic genomics company (Verogen) providing the assays (kits) instruments and software utilized for these types of modern analyses. This will include a brief technical overview and discussion of advantages and limitations of the various options, as well as a look at potential future improvements that may eventually lead to the end of the “cold case” as we know it.

<https://www.fbi.gov/services/laboratory/biometric-analysis/codis/ndis-statistics>

SDPD’s First Familial DNA Hit

Adam Dutra - San Diego Police Department Crime Lab

In 1992, 82 year old Angela Kleinsorge was sexually assaulted and murdered. The DNA results sat dormant in CODIS for almost 15 years. Due to advances in DNA testing, and the power of familial DNA searching, the case was finally solved.

The 2017 Las Vegas Shooting

Mike Ernst - Carlsbad Police Department

A personal testimony of a local police officer who attended the 2017 Las Vegas concert shooting. The presentation provides a learning opportunity for first responders who may have to report to a scene of a mass casualty.

A Countywide Criminal Cobweb—SDPD and SDO

Coral Luce - San Diego Police Department Crime Lab

Brande Silverthorn - SDO Crime Lab

A series of crimes were committed across San Diego County. Collaboration between the San Diego Police Department and the San Diego Sheriff’s crime laboratories helped link items of evidence and several suspects and unravel a web of crime.

Crime Scene Reconstruction: The Use of DNA to Outline the Path of a Killer

Marybeth Sciarretta - San Diego Police Department Crime Lab

In 2016, two women were held hostage in their home. One was sexually assaulted and the other was killed. A thorough investigation of the suspect’s movement through the house was aided by witness statements and recovery of touch DNA.

Fentanyl: Forensic Chemistry Trends and Decontamination

Shana A. Middleton - DEA Southwest Laboratory

A discussion of fentanyl trends, safety, and decontamination procedures.

That Old Black Magic: Forensic Misconduct, Wrongful Convictions, and the Ghost of Oklahoma Crime Lab Fraudster Joyce Gilchrist

Michelle Malkin - Investigative Journalist

An investigative journalist sheds light on Oklahoma’s continuing police crime lab lapses and misconduct in the wake of the infamous Joyce Gilchrist scandal, with emphasis on the perils of touch DNA and complex mixture analysis.

Ghost Guns

Bill Loznycky - San Diego Police Department Crime Lab

A discussion of “ghost” guns including legal classifications and safety issues.

The September 1935 Assassination of Senator Huey Long and the Enigmatic Bullet

Luke Haag - Forensic Science Services, Inc.

On the night of Sunday, September 8, 1935 United States Senator Huey P. Long, Jr. and former governor of the State of Louisiana was shot while in the corridor of the State Capitol building in Baton Rouge.

Thirty hours later he succumbed to his single perforating gunshot as a result of a botched operation. His purported assassin, Dr. Carl Austin Weiss, was immediately shot numerous times in the same corridor by a number of Senator Long’s bodyguards. An FN .32Automatic pistol, later determined to belong to Dr. Weiss, was purportedly found near his body. No autopsies were conducted on either gunshot victim nor did the subsequent inquest into Senator Long’s death specifically state that the cause of death was homicide or an assassination. The official police files on this case and any recovered physi-

ABSTRACTS, *cont'd*

cal evidence subsequently disappeared shortly after the incident. In 1991 various files, documents, photographs and some items of physical evidence were discovered in the possession of a relative of the former superintendent of the Louisiana State Bureau of Criminal Investigation and Identification. Among these materials was Dr. Weiss' FN .32Automatic pistol, a magazine with 6 live rounds of vintage Remington ammunition and a packet containing a single, slightly damaged vintage 71-gr, 32 Automatic bullet with distinct 6-right rifling engravings. This bullet was ultimately excluded as having been fired from Dr. Weiss' FN Model 1910 pistol. One additional item that was of major importance were photographs of Huey Long's suit coat carefully mounted on a display board and showing a contact gunshot defect to the lower right front of this garment and a probable exit hole in the back, both of which corresponded to the locations and path of his fatal gunshot wound.

This presentation will conclude with an assessment of what might be done today with this evidence in an effort to answer the question, "Who shot Huey Long?"

To Stress or not to Stress: Evaluation of Stress in Forensics

Jamie Lajoie - Los Angeles Sheriff's Department

Discussion on stress in forensics and survey results on stress.

Shotspotter: An Interdisciplinary Collaboration

Roxanne Kotzebue - San Diego Police Department Crime Lab

Laura Molyneux - San Diego Police Department Crime Lab

Criminalists from the San Diego Police Department share the expectations and the realities of implementing new work processes resulting in quick turnaround time for Shotspotter cartridge cases since the activation of Shotspotter in late 2016 in a high crime area of San Diego. Using a soaking method for DNA extraction, the cartridge cases must first go through processing in the Forensic Biology Unit before being entered into IBIS by the Firearms Unit. Current stats and successes are outlined.

Putting Together a Forensic Technology Section within the Crime Laboratory: Benefits and Challenges

Brian Lew - San Diego Police Department Crime Lab

Mobile device forensics is an emerging field in the forensic science.

Data from mobile devices (such as communications, locations, social media, and multimedia files) is now crucial evidence in the majority of crimes committed in today's society. Historically, mobile device forensics was conducted by police investigators at the San Diego Police Department. As an effort to enhance its mobile device examination capabilities, the San Diego Police Department Crime Laboratory created its own digital forensics laboratory. The Forensic Technology Unit began its digital forensic casework in November 2014 and obtained its ASCLD/LAB accreditation in May 2016. The process and costs to create and run the unit were higher than initially anticipated. This presentation will discuss the challenges in beginning a digital forensics laboratory and the benefits to investigations from having one.

Beyond Comparison – What Firearms Evidence Can Tell You About Your Crime Scene

Toniann Rebick - San Diego Police Department Crime Lab

People tend to think of firearms evidence in terms of comparison work, but the examination of firearms evidence can do much more than answer that basic question, "is it the gun?" In the limited universe of a crime scene, firearms evidence can narrow down the possibilities, direct the focus of the investigation, and provide a more detailed reconstruction. This presentation will highlight some of the characteristics of firearms evidence and discuss ways in which those characteristics can contribute to the reconstruction of a shooting scene.

Gun Crime and DNA

Roxanne Kotzebue - San Diego Police Department Crime Lab

This presentation will entail methodologies, success rates, and case examples regarding DNA analysis of guns at the San Diego Police Department.

Does this Fiber Have a Surface Modification?

Robert Blackledge - Forensic Consultant

Whether garments, carpeting, draperies or upholstery, many of today's fabrics have extremely thin surface modifications that impart qualities such as permanent press, stain resistance, and waterproofing. These surface modifications are so thin that most traditional fiber characterization methods only see the fiber core. A Questioned fiber could be placed into a much narrower class if on a single fiber basis it were possible to detect the presence of these surface modifications and determine their chemical characteristics.

Often these surface modifications are some type of fluorocarbon. This presentation will describe a new ionization method, pyrolysis Gas Chromatography Plasma-Assisted Reaction Chemical Ionization Mass Spectrometry (py-GC-PARCI-MS) that in the negative ion mode strips any halogens from pyrolysis fragments and introduces halogen ions into a mass spectrometer. As a result, any interference from the non-halogenated fiber core is alleviated; enabling sensitive detection of thin halogenated surface coatings. Rather than trying to detect a wide range of mass to charge ions, the detector is in single ion mode

(19 m/z for fluorine). If upon pyrolysis the pyrosolate had been directly ionized and fluorine fed into the mass spectrometer, then the detector would only tell you if any fluorine bonds are in your sample; then the detector would only tell you if any fluorine bonds were in your sample; you would have no chemical information. But this is changed if all the pyrolysis fragments (the pyrolysate) are first introduced to a GC column and are separated according to retention time. Then, although the MS detector only sees the 19 m/z ions, they will be spread out into a 19 m/z mass chromatogram that will be characteristic of any original fluorine bond-containing molecules in the surface modification. The is that py-GC-PARCI-MS can not only determine whether a Questioned fiber bears a surface modification that contains bonded fluorine, but the 19 m/z mass chromatogram will distinguish between surface modifications containing different fluorine bond-containing molecules.



Inside the Criminalist

This issue of Inside the Criminalist features Alice Hilker

Q: When did you first join CAC?

I first joined the CAC in 2001, when I returned to California from the east coast. I was working at SERI at the time. I served as the DNA Study Group leader and the regional director north prior to becoming president elect. For those of you thinking about becoming more involved, attend your local study group, or even better, present at your local study group. It's a great way to get to know people from other labs in a less formal setting than the larger meetings.

Q: What is your most marked characteristic?

I would probably have a different answer to this question any given day. As a kid, it would have been severe myopia, thick glasses, extreme shyness, and big hair. Today, I would say that it is that I am a joiner; I like to be involved, sign me up!



Q: What do you appreciate the most about your friends?

I have a very supportive network of friends and for that I am very thankful! I also appreciate their honesty, their humor,

and the fact that many of my friends are working in professions that are interesting and that they really enjoy.

Q: What is your main fault?

See "what is your most marked characteristic?"... I think that I am currently likely to overcommit myself and end up stressing about time. To make up for it, I am not afraid of working really hard.

Q: What is your favorite occupation?

This one, of course! I am very lucky to have a job in this field, which basically was my dream job since I was in junior high. It has been twenty years since I got my first job in forensics. Currently I supervise (and do casework in) Forensic Biology and DNA, as well as supervising the Crime Scene section at the San Mateo County Sheriff's Office Forensic Laboratory. I am also very lucky to work with an excellent group of criminalists and a supportive management team.

Q: What is your greatest fear?

This type of questionnaire! I am easily embarrassed and this type of questionnaire preys upon that fear. My real fear is becoming irrelevant or losing touch with where our field is going. Even after I retire, I would like to continue to be involved.

Q: Which living persons do you most admire?

My mother came to the US on her own; she inspires me to love foreign languages and cultures and to not be afraid to try different things, even if it means going it alone. My father worked a job he loved for 42 years and he inspired me to always work hard, and to find an occupation in which I look forward to going to work (almost) every day. I admire my husband's fearlessness, intensity, and passion for both his work and his skiing. I owe him in a huge way for helping me develop as a Criminalist and a supervisor.

Q: Which talent would you most like to have?

Great natural communication skills and quick wit.



Visit the **CAC Store**

www.cacnews.org/catalog/





California Association of Criminalists

CALL FOR PROPOSALS

2019-20 McLaughlin Endowment Funding

The A. Reed and Virginia McLaughlin Endowment of the California Association of Criminalists is beginning its annual cycle of grant funding. During 2018-2019, grants for training, scholarships and research totaled over \$28,260. Applications and requests are now being accepted for 2019-2020 funding.

The Training and Resources (T&R) Committee Chair must receive applications for training funds by **Friday, February 22, 2019**. (See Section I below for specific application information). Applications shall be for training events scheduled for July 1, 2019 to June 30, 2020.

The Endowment Committee Chair must receive requests for all scholarships or research funds by **Friday, March 22, 2019** for consideration. (See Sections II & III below for specific information).

Specific Requirements for Proposals

I. Training

A. General

Requests to sponsor training must be submitted earlier than other requests so that the Training and Resources Committee can review them and coordinate with other CAC training efforts. The T&R Committee shall prioritize these requests where necessary and shall consider how the requested training fits into the overall training needs/desires of CAC members. The T&R Committee shall forward ALL requests to sponsor training together with their recommendations to the Endowment Committee for their consideration.

B. Request Format

The two-page Application for Training Funding should be completed. This application is available on the CAC website (www.cacnews.org) and requests the following:

1. Class title, outline and description of ownership (public or privately owned).
2. Information (curriculum vitae) on instructors.
3. Class logistics: minimum and maximum size, limitations and location.
4. Class coordinator/contact person.

5. Student interest/demand supported by T&R Survey and/or the number of applications on file.
6. Course budget including supplies, texts or handouts, instructor fees, travel/per diem, and site costs. Amortize material fees for # of CAC member/class.
7. Student fees.

Send completed Application for Training Funding forms to the T&R Committee Chair by **Friday, February 22, 2019**.

II. Scholarships

A. General

The A. Reed and Virginia McLaughlin Endowment offers scholarships through academic institutions rather than directly to students. Proposals from academic institutions shall set forth their general criteria for student scholarship selection. The academic institution shall be responsible for selection of student recipients of such scholarships and shall report awardees and amounts to the Endowment. Applicants must have a minimum of 3.0 GPA overall and 3.0 GPA in their major. Students receiving funds must be members of, or applicants to, the CAC. Students who are interested should request application information directly from their academic program coordinator.

B. Request Format

Proposals for scholarships must contain both a summary and detail section containing a general description of the academic program, its goals, and information on how the proposed funds would be used. For example, will funds be used for tuition and fee relief, stipendiary support, to underwrite student research, etc? The detailed description should include information on recipient selection criteria and who will perform the selection. Scholarship fund administrators must be named, including who will be responsible for submitting the mandatory annual report of activities to the CAC. As a condition of funding, products of research must be submitted to:

1. CAC Seminar Technical Program

Chairperson with intent to present research at a CAC seminar; **or**

2. CAC Editorial Secretary for publication in a journal or newsletter as appropriate.

C. Reporting of Distributions

The Academic Program Coordinator must provide a full accounting of the recipients and how they meet the minimum criteria.

D. Refund of Unused Endowment Funds

Any remaining unused portion of the endowment funding shall be returned to the Endowment fund via the CAC Treasurer.

III. Technical Development and Research

A. General

The implementation of new and more efficient technical procedures related to forensic science requires the investment of time, ingenuity, and resources by those working in the field. The development of new techniques and technology can benefit the profession by one or more of the following:

1. Permitting the development of new or additional information from the analysis of certain types of evidence.
2. Implementing a mechanism for the analysis of new forms of evidence.
3. Improving the reliability of methods already in use.
4. Increasing sample throughput by improving efficiency.

Resources permitting, the CAC encourages technical development or research for the benefit of the profession and the association. The A. Reed and Virginia McLaughlin Endowment does not generally fund professional level salary for researchers. Incidental funds for students assisting in research projects will be considered. However, neither the CAC nor the Endowment shall act as an employer.

B. Request Format

Requests for funding for technical development or research should contain the following:

1. Project name and purpose.
2. Name(s) and curriculum vitae for each researcher.
3. A brief description or outline of the project.
4. Information on the project facilities, equipment and supplies needed.
5. Information on the project site, including permission to use the site for this purpose where applicable.
6. Information on the adequacy of available space, safety planning, equipment and supplies.
7. Agreement for responsibility for disposal of products of research, including but not limited to chemicals, biochemicals, biologicals, and hazardous waste.
8. Project budget.
9. Time line and projected completion date of project.

C. Progress Reports

Progress reports will be required in writing, the frequency to be determined by the Endowment Committee. The recipient must prepare a final project report, including a summary of results and conclusions. As a condition of funding, products of research must be submitted to:

3. CAC Seminar Technical Program

Chairperson with intent to present research at a CAC seminar; **or**

4. CAC Editorial Secretary for publication in a journal or newsletter as appropriate.

When problems occur or results are not as expected, funding recipients are expected to use good judgement in reevaluating the course and goals of the project, and in modifying the project approach as necessary to maximize the project results. The project should be terminated when it is determined that the value of the project is minimal. In addition, funding may be terminated by the Endowment Committee if progress is inadequate.

The T&R Chair must receive all proposals for **training** by **Friday, February 22, 2019**.

Send proposals to:

Trevor Gillis
Santa Clara County DA Crime Lab
250 W. Hedding St.
San Jose, CA 95110
Tel: (408) 808-5900; Fax: (408) 297-6532
tgillis@lab.sccgov.org

The Endowment Committee Chair must receive all proposals for **scholarships or research** by **Friday, March 22, 2019**.

Send proposals to:

Nessa Rosenbaum
San Bernardino County Sheriff's Dept.,
Scientific Investigations Division
711 E. Rialto Ave.
San Bernardino, CA 92415-0056
Tel: (909) 387-9980; Fax: (909) 387-9964
nrosenbaum@sbcisd.org

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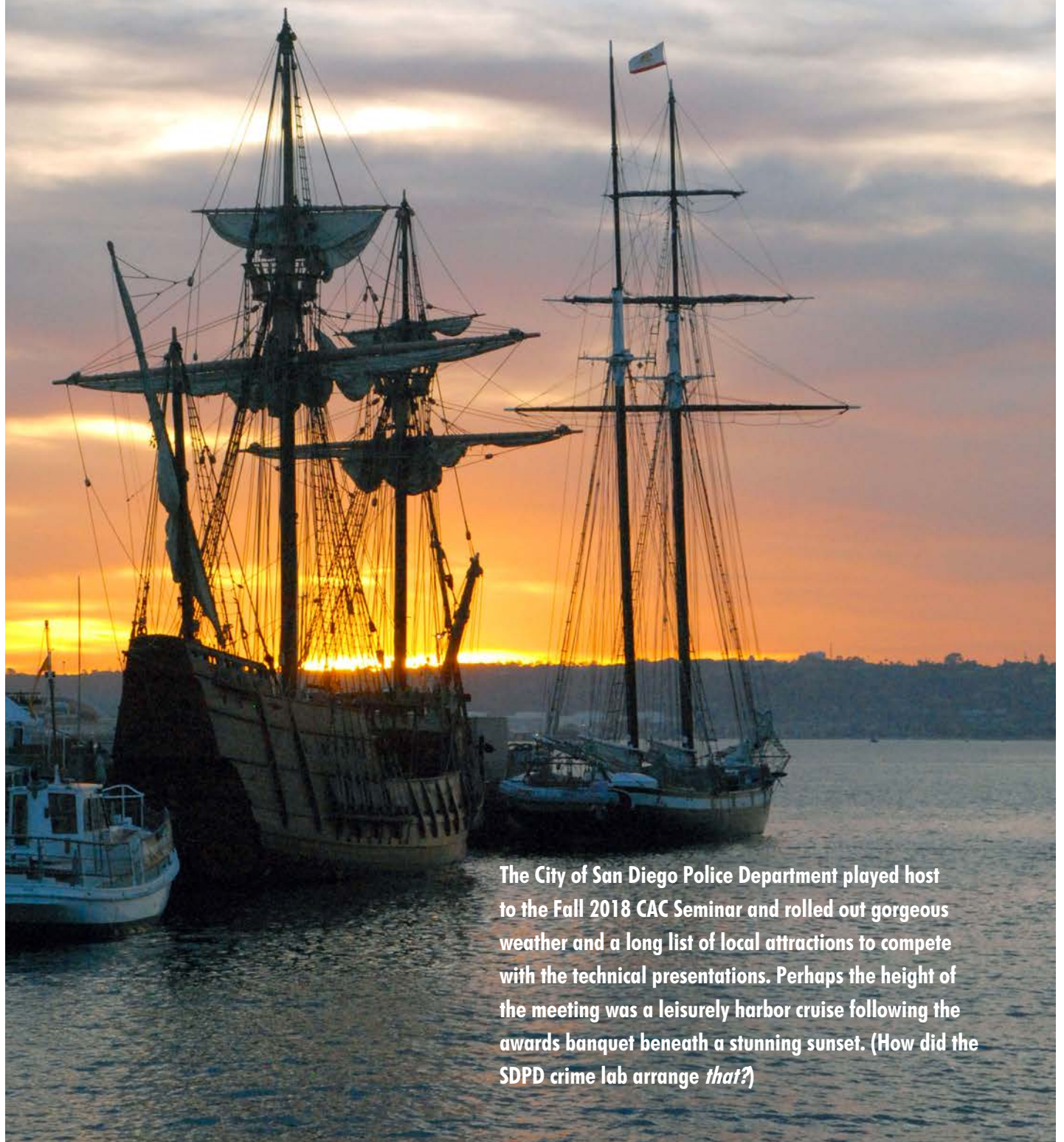
Preference will be given to CAC members and California Universities/Colleges with Forensic Science programs.

Applications that miss the deadline dates will not qualify for consideration.

If you submit a proposal and do not receive confirmation from the Endowment Committee that it has been received, call the Chairperson before March 22, 2019.

San Diego

FALL CAC SEMINAR 2018



The City of San Diego Police Department played host to the Fall 2018 CAC Seminar and rolled out gorgeous weather and a long list of local attractions to compete with the technical presentations. Perhaps the height of the meeting was a leisurely harbor cruise following the awards banquet beneath a stunning sunset. (How did the SDPD crime lab arrange *that?*)

Fall 2018 CAC—Go Mad for Forensic Science



A great week from the Beginning...

...to the End

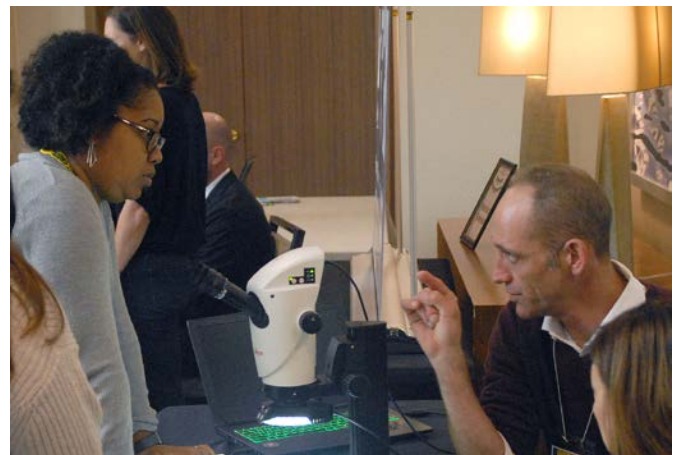


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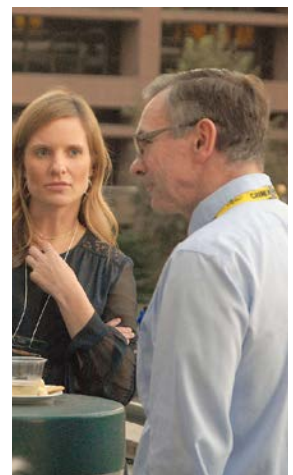
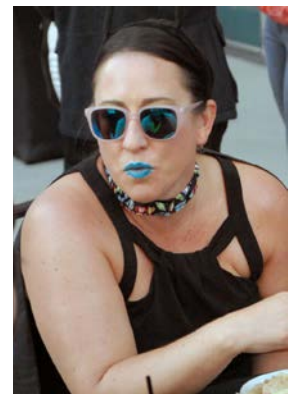
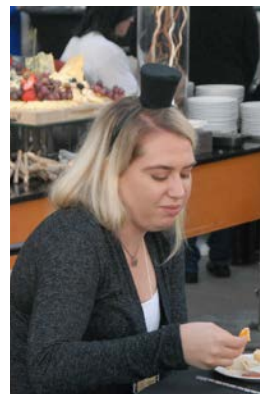
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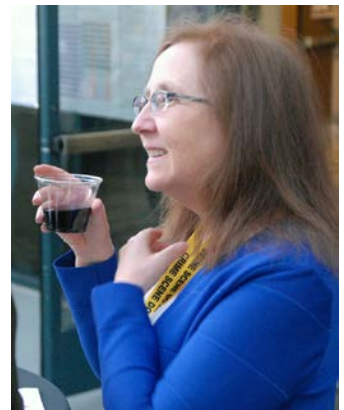




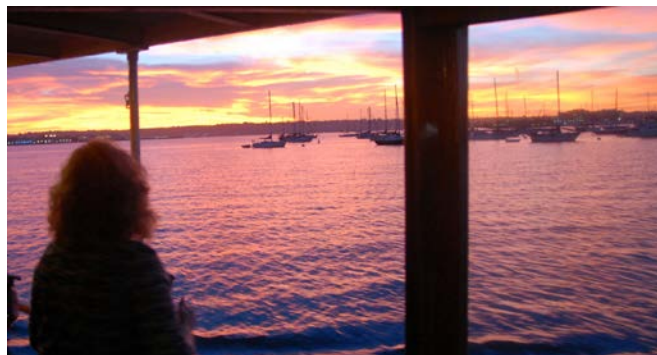
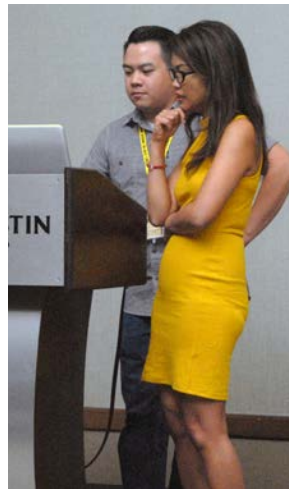
Vivien Lee photo

Fall 2018 CAC—Go Mad for Forensic Science





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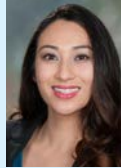
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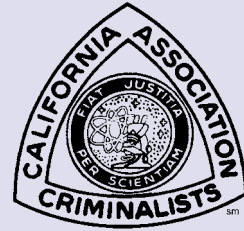


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Facets of Forensic Science

Spring 2019 CAC Seminar

May 13-17, 2019

Waterfront Hotel

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Oakland, CA



Come and Celebrate the Oakland Police Department
Crime Lab's 75th Anniversary