

chris Coleman



CAC President

Here I was.

Nine months removed from my native state of Wyoming, where I had dreamed about getting into forensic science from a young age.

Self-Reflection, CAC & the Future

It's been a couple of weeks since the wonderful meeting in Ventura. Before I go any further, I want to thank Regina Davidson and the rest of the host committee for an excellent meeting! I had a great time and it appeared that everyone in attendance did as well. Great job! I also want to thank the members of the board that I have had the honor and privilege to serve with this past year. You are all awesome! Thank you for all the hard work you do for this great association!

So now to my self-reflection. As I drove down I-5 on my way to Ventura, other than listening to the SF *Giants* game on the radio (they won!), my thoughts were swirling about what I was going to say when the reins were passed to me that coming Thursday. I have been a member of this association for 23 years, the longest of any of my professional affiliations. I became a member of the CAC even before I had graduated from Sac State with my forensic science degree and started working.

I remembered back to how my affiliation with the CAC began. I was taking a class on personal identification taught by Jerry Chisum. Jerry was an excellent instructor and his passion and enthusiasm for his profession was evident. Always smiling, he had the best stories about various crime scenes he had been to and techniques he had mastered in the lab. It was a great class during which I learned a lot about the history of our field. One night after class, I was asking Jerry some random question about the topic of the evening and he mentioned to me that I should go to the CAC dinner meeting that was going to be taking place the following week. He wrote down the directions and time for me. (This was pre-internet and cell phones folks, just to give you some perspective). So, that following week my friend Vincent and I jumped into my car and drove down to the East Bay for the meeting. I had only been in California about nine months at this point and couldn't even tell you where we went! My friend navigated for me as he consulted the trusty Thomas Guide. No Google Maps back then. We found the place and enjoyed dinner and the guest speaker, a detective who talked about gangs and the occult. Although this presentation was fun and informative, the "best" part was sitting around afterwards listening to the stories being told by the people present. Jerry was there, and introduced me to several other people whose names I don't recall. I was just too in "awe" of the whole night. Here I was. Nine months removed from my native state of Wyoming, where I had dreamed about getting into forensic science from a young age. In fact, I turned down my spot at the Air Force Academy in Colorado Springs to pursue my dream of forensic science here in California. And now I was sitting among a group of people, whose names I had seen on articles published in the *Journal of Forensic Sciences*, hearing their stories about research and discoveries, refinement of techniques, interesting and bizarre cases, and procedures they preferred for processing different types of evidence at scenes. I was in nirvana!

Jerry had a CAC application for me at class the following day and sponsored me as a student affiliate. I was now a member of the California Association of Criminalists! I became good friends with Jerry and remain so today. He still has a special place in my heart, not only for getting me into the CAC, but as a mentor and overall great person. Thank you Jerry!

I graduated the following year. I finally got a job after applying to every crime lab in the United States. Literally. I sent letters to every lab I could find at the time by going through the AAFS members directory. There were

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The deadlines for submissions are: December 1, March 1, June 1 and August 15.



Scene Proficiency

Heather Cereoli and Jason Kwast try out the demo crime scene proficiency test exhibited at the recent CAC meeting by CTS. More seminar photos inside.

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771 labs in 1993 that I could find. LAPD hired me and I started working, and making my own memories...

As I reached Ventura, the speech in my head was coalescing. The board meeting on Monday went well. Tuesday was spent up on the mountain shooting things. One of my favorite things to do! Jim Roberts and Song Wicks did an excellent job setting up the workshop! All in attendance had a great time. The main conference started on Wednesday. I saw old friends and colleagues, met new people just joining the profession, and heard some great presentations. That night's activities were fun and allowed me more time to talk to old and new members alike. Unusual scenes, interesting cases, and preferred procedures were some of the topics discussed. Thursday's program was just as good and I got to mingle more. As the day continued and more conversations took place, I started to notice something, that at least to me at the time was interesting and amusing, and then enlightening as I thought about it more. I was having a conversation with Luke Haag about a particular anomaly that we were trying to sort out from the workshop on Tuesday, and I noticed a group of students from LA State listening intently. They had that same gleam in their eyes and smile on their face that I probably had 23 years before when I was the one listening during my first CAC dinner meeting. After talking with several of them and checking out their posters, I was impressed by how intelligent and articulate these representatives of the new wave of future forensic scientists were.

As I walked back to my room to change into my pirate garb for the banquet, it finally hit me. I am a forensic scientist! After all those years of planning and dreaming while going through school, starting my career, and working for the past two decades, I had finally become what I had always dreamed of. I have always described myself as a criminalist or forensic scientist when someone asked me what I did for a living, but it never felt like it did at that moment. A moment of true clarity. As I stood there in the mirror and adjusted the pirate sash on my head, the whole speech I had previously prepared disappeared. Names like DeForest, Blackledge, Haag, Tulleners, and Springer were going to be present that night. I had read papers and seen presentations by these people. Real Forensic Scientists! I was about to become the president of a historic organization who lists names like Murdock, Morton, Dillon, Longhetti, Chisum, Thornton, Brackett, Pinker, Bradford, and of course Kirk, as past presidents! So when I stepped up and received that coconut from Greg, and all eyes were on me, I just spoke from my heart about what a privilege it is to belong to such an esteemed group of professionals, and that I was in awe that they chose me to represent them.

I want everyone to know how honored I am to be the president of the California Association of Criminalists, an organization with incredible history and incredible people. I am proud to represent this association and I can assure you that the board and I will do our best as we move forward into the uncertain future of forensic science. There are many changes looming with the creation of the Organization of Scientific Area Committees and the National Commission on Forensic Science. But, if we can engage the future by embracing our past, then I think our future is looking mighty bright! Have a safe summer everyone.





CAC Member Takes Univision on a Tour

José González says, "I really tried hard to give some insight into our profession. I even translated the following poetic expression by Paul L. Kirk of the Locard exchange principle into Spanish and then read it for them out loud in Spanish. But alas, the producers in Miami cut it out of the final video segment. Too long I suppose. "Wherever he steps, whatever he touches, whatever he leaves, even unconsciously, will serve as a silent witness against him. Not only his fingerprints or his footprints, but his hair, the fibers from his clothes, the glass he breaks, the tool mark he leaves, the paint he scratches, the blood or semen he deposits or collects. All of these and more, bear mute witness against him. This is evidence that does not forget. It is not confused by the excitement of the moment. It is not absent because human witnesses are. It is factual evidence. Physical evidence cannot be wrong, it cannot perjure itself, it cannot be wholly absent. Only human failure to find it, study and understand it, can diminish its value."



Greg Matheson on National Panel

On Thursday, April 30, Greg Matheson (*l*), former CAC editorial secretary, was part of a four-person panel invited to provide the National Commission on Forensic Science with a primer on evidence, from collection to destruction. It is essential that members of the commission be informed of the specifics of issues associated with the delivery of forensic science services to the criminal justices system. The commission members are dedicated to improving forensic science, but, since most are not forensic scientists, they need to be educated and informed about what affects our profession. They were very interested in the presentations and willing to learn.

Videos of the commission meetings can be accessed at: http://www.justice.gov/ncfs/meetings





CAC Service Awards

Regina Davidson (seminar chair), Eucen Fu (tox. study group), Eric Halsing (past president), Meghan Mannion-Gray (treasurer), Greg Matheson (editorial secretary), Mey Tann (regional director, south), Eric Wahoske (fire debris study group). The W. Jack Cadman Award was presented to Kevin Andera (in the pirate costume) and the Edward Rhodes III Memorial Award was presented to Cynthia Chen (above,r). The Alfred A. Biasotti Most Outstanding Presentation Award went to Mignon Dunbar for her paper "Let's Get Naked." The American Board of Criminalistics Examination Award was given to Dawn Chin-Meun.



At the recent John Jay College 50th Alumni Reunion Dr. Peter DeForest was honored to receive the Distinguished Faculty Award. He is posing here with his daughter, Kimi, on the bench his students dedicated. The plaque reads, "In Honor of Carol and Peter DeForest DCrim. Thanks From Your Forensic Students."



The 2015-16 CAC Board of Directors (l-r) Brooke Barloewen, presidentelect; Meiling Robinson, editorial secretary; Michelle Halsing, membership secretary; Kirsten Fraser, recording secretary; Helena Wong, treasurer; Chris Coleman, president; Greg Laskowski, *immediate past president;* Alice Hilker, regional director, north. (not pictured, Jamie Daughetee, regional director, south.)



Your 2015 CAC Board deciding the important issues of the day.



Duayne J. Dillon 1929 - 2015

Long-time CAC member and Past President Duayne J. Dillon passed away March

8, 2015. His forensic career spanned many decades and laboratories including the State of California Orange County and San Francisco. Before he retired, he held the titles of Chief



Criminalist and Assistant Sheriff for Contra Costa County. During those tenures he earned a doctorate in criminalistics from U.C. Berkeley, in 1977. His 442-page dissertation was titled, "A History of Criminalistics in the United States, 1850-1950. He served as CAC president from 1972-1973, receiving the infamous coconut from Tony Longhetti. In 1998 he was named CAC Distingushed Member. As recently as 2006 Duayne presented his paper, "The Middle Years: Criminalistics 1949— 1979, " at the Concord

seminar. Just two years later he was elevated to life member.

After his retirement from public service he began a successful private consulting practice regarding questioned documents and continued to enjoy a full life.

Reflections on Duayne Dillon

Dorothy Northey

Duayne was a generous man who never talked down to people. He was proud of his doctorate and equally proud of his own wife's accomplishments. As such, he was never anti females in the laboratory even at a time when some were not so accepting. That is something for which I was personally grateful. He was more of a hands-off administrator and allowed people to do the work they were hired to do without interference. He could most commonly be found in his office with the door closed and rarely in the back of the laboratory. Presumably he was busy with administrative things and doing document work which was an on-going interest of his. That did not mean he was not approachable. You could readily discuss things with him without arguing making him a pleasant person to be around. He was, dare I say, one of the old guard of

criminalistics in California who paved the way for others to follow. On a personal level he was a family man of the Catholic faith with an almost sly or impish smile/grin with eyes that sometimes seemed to twinkle. He lovingly cared for his wife towards the end of her life. Being concerned about physical fitness he spent many a happy hour at the gym long after his retirement and essentially up to the time of his death. All who knew him will have pleasant memories of him.

Lloyd W. Cunningham

When I first entered the field of Forensic Document Examination I was informed by my mentors to be aware of individuals who claim to be forensic document examiners but who are marginally trained and should not be practicing experts in that field. Dr. Duayne Dillon was accused of being one of those individuals.

Eventually, I met Dr. Duayne Dillon and we discussed document examination in great detail, which proved to me that he certainly possessed considerable knowledge about handwriting analysis and all of the other aspects involved in forensic document examination. That knowledge alone did not convince me that he was capable of being a practicing expert; in other words, at that point he could talk the talk, but could he walk the walk? To determine if he could "walk the walk" I invited him to my office and I presented several difficult handwriting cases to him for examination. After he methodically examined each case we discussed his findings and conclusions, and he also provided me with the basis for his conclusions.

Subsequently, Dr. Dillon and I peer reviewed each other's case work and we then became colleagues and very close friends. In fact, at that particular time I was the President of the South Western Association of Forensic Document Examiners and I nominated Dr. Dillon for full membership. After a board hearing he was accepted as a member of SWAFDE. We had lots of fun preparing several technical papers together and we presented a workshop together for SWAFDE.

Our friendship grew to the point that we discussed gourmet cooking and fine wines more than document examination. In fact, Dr. Dillon and his lovely wife Helen occasionally dined with my wife and me at his favorite Italian restaurants. He was a real wine snob!

I will miss our late night phone conversations while he sipped his bedtime martini. Yes, a bedtime martini! Dr. Dillon was not a heavy drinker, but he always enjoyed one martini before he retired at night. His son informed me that on the evening he passed away they dined at an Italian restaurant. I asked his son if he had his last martini that evening, and his son replied, "Yes, the empty glass was on his night stand."

Great guy! I really miss him.

Some material adapted from an obituary published in the *Contra Costa Times* on May 12, 2015.

Chuck Morton

When working at Paul L. Kirk, Ph.D & Associates starting in 1962, in addition to doing original investigations and analyses, I was fortunate to have the opportunity to review and reanalyze evidence from laboratories around the state and the country. I quickly learned that the work coming out of the Contra Costa Co. Sheriff's laboratory headed by Duayne Dillon was exceptional and reliable. I soon became aware that Duayne Dillon was among the exceptional crime laboratory directors in the field. He set and nurtured a high level of work and ethical behavior in his laboratory.

But it wasn't until after he retired in the mid 1980's that I got to know Duayne for what a remarkable person he was. I, among other criminalists, was hired by the defense and Duayne was appointed as a special master by the court, in what would become the longest and most expensive criminal murder trial in Orange County history. This was the Randy Kraft serial murder case. This case involved the frequently sadistic murders of young men, mainly in, but not limited to, Southern California between 1972 and 1983 (estimated to have been between 50 and 60 homicides but likely more). In an unusual move the court appointed Duayne as a Special Master to monitor the handling of the physical evidence by the numerous criminalists that had been hired by the defense team. For more than a year I, and others, would travel to Orange County to examine the evidence and Duayne would be there keeping an eye on and a record of the handling of the evidence. It was rumored that the cost of this case almost bankrupted Orange County.

During this protracted period Duayne and I got to know each other better after the workday over dinner and wine in many of the restaurants of Orange County. I became aware of the quality and character of the man and the fact that we had both been stationed in the U.S. Air Force in Europe during the 1950's. He was stationed in Germany and being in the Office of Special Investigations liked to brag that he always wore civilian clothes and ate only in Italian restaurants while in Germany. I, on the other hand, was in the Air Police in England and could only bemoan the sorry state of English "cuisine."

After the Kraft case and our return to the Bay Area we started attending computer special interest group meetings on the Berkeley campus, preceded by what had become our habitual dinner and wine and discussions about forensic science issues, cases and news and occasionally Ireland. After the Berkeley group folded we continued what had now become a tradition in Pleasant Hill nearer his home in Martinez. This was always about a chance to discuss the history of the field, Dr. Kirk, Criminalistics, interesting cases and food and wine more than the tips we picked up at the computer meetings. Our final get together was the week before he died. He had been getting frail but was always up for going to the gym, was in a good mood and enjoying himself. I last saw him a week before he unexpectedly died when we had a chance to have one of his well known nighttime martinis. I am sure we did not solve any of the world's, or even the field's problems although I suspect the martinis made us think we had. I am equally sure that we managed to repeat most of, if not all, of the stories and discussions we had over the years.

The years were definitely enjoyable but have gone by too rapidly and I know I will miss him and his frequent contributions to my knowledge and appreciation of the field we both enjoyed and loved.

Marty Blake

Now that I've been retired awhile, I enjoy reminiscing about how fortunate I was to have personally known so many of the great elder California criminalists during my career. Many in my generation of baby boomer criminalists in California were raised by the great generalists, especially those of us who began our journey at the UC Berkeley School of Criminology.

Dr. Duayne Dillon was one of my favorite elder statesmen in all things forensic. When I was a criminalist Intern at the Contra Costa County Sheriffs Lab, he was the chief. While he was cordial to us lowly interns, I didn't get to know him well until I became a forensic document examiner and also lab director of the San Francisco PD Crime Lab. He would call me from time to time, usually to discuss some issue affecting forensic science. Most of our discussions were about casework or proficiency tests that strayed from good science to bad science and how important it was for practitioners to use sound reasoning and good judgement while examining evidence. We talked a lot about proving the individuality of handwriting and the evaluation of empirical evidence and correlated evidence in handwriting specimens.

He also cared about me and any struggles I was having at the SFPD Crime Lab, and I had a few! He knew a lot about the history of the lab as he was employed there very early in his career. I asked him to give a talk to the lab staff about this history as we were preparing for accreditation and his presentation was well received, as many staff members knew little about the origin of the lab.

Dr. Dillon and I would occasionally meet at AAFS meetings and discuss forensic science over drinks. He always made me feel that he truly valued my opinions. He had a wicked sense of humor and we had some good laughs over the years. I came to think of him as my forensic dad because he would challenge my thoughts, provided keen wisdom, and cared about my welfare.

I miss him already.

Celia Hartnett

I first crossed paths with Duayne Dillon when I was a student in the School of Criminology at the University of California, Berkeley in 1973. Our field was a small one in those days, and so it was inevitable that our paths would cross again in the future. The manner in which that happened, however, could never have been predicted.

Duayne was a presence on the periphery of my career during the decades I spent working for government labs. He was the head of the Contra Costa County Crime Lab and his lab had an enviable reputation at the time. But he was a "big wig" at the time, and I moved in more mundane circles appropriate to my bench level criminalist position.

It wasn't until 2007 when I was the lab director at an independent crime lab that Duayne and I really became comrades. Our lab frequently received requests for document examination services, and I asked Duayne if he would be interested in a collaboration. It soon became evident that this arrangement was going to work out great. Duayne had an incomparable level of expertise and professionalism in document examination. He had a voracious interest in new technology and

Cont'd

Duayne J. Dillon

emerging analytical methods that never dimmed. But what was most special about Duayne was his unwavering interest in trying to ensure that knowledge was passed on, and that the forensic field had an opportunity to flourish in an atmosphere of scientific sanctity.

I will remember his generous gifts to the staff of gigantic boxes of See's candies, his impromptu visits for lunch when he insisted on driving us to the restaurant in his battleship-sized car, our discussions on everything from the analysis of ink to the examination of relics attributed to Butch Cassidy and the Sundance Kid. But what I will remember most is the faith he had in me as a professional, and his enthusiastic support for our shared mission of achieving scientific integrity.

Morris Grodsky

Thanks for informing me about Duayne. He was a very nice guy and a fine criminalist. I can remember him in Dr Kirk's lab. I was so impressed that he had studied criminalistics in Germany. I believe he was there in the military. And yes, I had occasion to get assistance from him on several cases, one of which was the *Robillard* case [*CACNews* 2nd Q 2008]. We examined the stolen car together, recovered fingerprints, and I, using ninhydrin for the first time, developed Robillard's prints on a map we found in the glove compartment. I think he was the first real criminalist in the San Francisco lab.

John Thornton

(As recorded by Chuck Morton at the memorial luncheon) John Thornton reflected on the fact that out of Berkeley he was hired into the Contra Costa County Sheriff's Crime Lab by Duayne over a much more experienced person and appreciated that plus the fact that Duayne was so patient with him beyond "what I may have deserved." "He took a chance on me." John also commented on how much he benefited from that experience. It was a different world back then just two of them in the lab and a secretary who didn't come in on Fridays which opened up the opportunity to put heads down on desks and take a nap in the afternoon—John said that you don't go into labs now and see people napping—they may be distracted in other ways now but not napping.

He has fond memories working with Duayne and had much more time with Duayne with only the two of them working in the lab than those who came later when the laboratory had many more people.

CAC Presentations:

The Middle Years: Criminalistics 1949—1979. Spring 2006.

Semi-automated Fingerprint Retrieval Employing "Termatrex" an Optical Coincidence System. Fall 1976.

Micro-organisms and the Presumptive Chemical Tests for Blood (with Edward Blake). Fall 1971.

Consideration on the Chemical Development of Fingerprints. (with Stan Dorrance) Fall 1971.

Current Physical Evidence Utilization in the Criminal Justice System. Fall 1971.

Seminal Stains. Spring 1964.

Comparison Of Commercial Greases by Gas Chromatography Of Their Pyrolytic Products. Spring 1964.

Types of Finishes on American Automobiles. Spring 1962.

A Gem from the CAC Archives...

The Fighting Fish Test was proposed by Duayne and John Thornton. If they put a little LSD in the container of a Siamese Fighting Fish it would float and do strange things for a while. It worked they said. I never tried it.

The *Betta* is a genus of gourmai fish, the most known one is the Siamese Fighting Fish. I'm not sure it was published but they gave a paper at a CAC meeting. Try 1965 or 6? Best information would be from John Thornton.

Jerry Chisum

* * :

28th SEMI-ANNUAL SEMINAR (Fall 1966) CALIFORNIA ASSOCIATION OF CRIMINALISTS October 14-15, 1966 OAKLAND, CALIFORNIA

A Sensitive Bioassay for LSD

John Thornton & Duayne Dillon, Contra Costa County Sheriff's Office.

Bioassay was investigated as a possible means of determining it a subject is "under the influence" of LSD. Nominal hallucinogenic doses give blood levels of approximately 10-15 x 10-9 gm/cc. Half-life of LSD in blood is approximately 3 hours. The primary detoxification mechanism is excretion into the bile with maybe as much as 1-2% in the urine. Urine excretion must be neutral for recovery, as it will irreversibly aromaticize to napthalene derivatives if acid and racemize to pharmacologically inactive iso-lysergic acid if basic

A four-page handout described the bioassay method, using Siamese fighting fish in 10-15 ml of water solution with a minimal detection limit of 2-3 micrograms of the drug. Although references indicated the test is specific for LSD, Thornton expressed reservation, in that other hallucinogens have not been tested.

The procedure was not recommended for use on biological material as originally conceived, but Thornton thought that it might have applications in some instances of LSD drug identification.



Duayne Dillon Memories

(above) Memorial Luncheon at the Bistro Don Giovanni, Napa, April 18, 2015. (clockwise from left to right)
Chuck Morton, Carol Hunter-Moon, Mary Gibbons, Steve McJunkins, George Sensabaugh, Steve Ojena, Peter Barnett, Dorothy Northey, John Thornton, John Murdock, Marty Blake.
(middle left) lunch with Dorothy. (middle right) Karen Sheldon with Duayne. (below left) John Thornton,

(middle left) lunch with Dorothy. (middle right) Karen Sheldon with Duayne. (below left) John Thornton, Duayne, Richard Walley, Earl Falkenstrom. (below right) Helen and Duayne with Peter DeForest.

Photos courtesy of Chuck Morton.









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CAC Editorial Secretary

What is apparent is that forensic science, as with all of science, is a double-edged sword—both beautiful and dangerous.

Fiat Justitia per Scientiam

In pursuit of science and justice

In one of his final interviews, Carl Sagan said, "Science is more than a body of knowledge, it's a way of thinking." I remember watching Sagan's interview on the *Charlie Rose* show and thinking that there was permanence in his statement. I was enthralled; he so elegantly expressed how I felt about science. That science is not just a cold collective object, but also a "way of thinking", as in a *method* or manner—a way of life. It's the essence of and the core guiding principle of a criminalist and CAC member—let justice be done through *science*.

As criminalists, we are fully aware of our precarious place, this unique niche in between science and criminal justice. For the most part, we remain comfortably within the laboratory walls performing our science. It is only when a subpoena arrives that we start to think about our other obligations as a forensic scientist. From that moment on, we begin to be concerned about how others perceive us in the courtroom. Whether you're an expert in the analysis of drugs, firearms, DNA or trace evidence, makes no difference, there's no question that when you enter the courtroom, you regard yourself a scientist. But what role do you fulfill to the prosecuting attorney, to the defense attorney, to the judge, and to the jurors? In an ideal world, I suppose you'd still be a criminalist, but what image of scientist do they perceive you to be and what is the quality of the science you performed?

I believe there to be a huge disconnect in how we individually perceive our roles as forensic scientists and how others perceive ourselves. Oddly, though, these "others" are not just those who we all recognize and know to be "outsiders", such as lawyers or politicians. It seems that even among us there are divisions where groups of the self-proclaimed "true generalists" are aligning in natural opposition to the specialized analysts of our modern crime laboratory. Do we not consider both generations of criminalists—the generalist and the specialist—equally deserving of the title? Are they both scientists? And in the midst of our inner turmoil of science blaming, shaming and pontificating, the "outsiders" are unifying in their resolve to provide oversight, "reining in" the field of forensic science, which they perceive as having "gone rogue."

Maybe it's not easily apparent whether or not the criminalists of the modern crime lab are scientists. But then again, how does one make that assessment? By what measure can you determine the truth? During Lucien Haag's Founder's Lecture, he quoted Edward Blake's advice: "If in your analysis you do not consider reasonable alternative explanations for an event, what you're doing is not science." By that standard I believe that all of us are indeed scientists, seeking better ways to not only understand evidence but also our world. Perhaps it's not to be understood, maybe all there is, is the pursuit. That by living this way of life, by practicing the method of science, we may aspire to one day be worthy of the title scientist.

What is apparent is that forensic science, as with all of science, is a double-edged sword—both beautiful and dangerous. In one hand, science is giving, revealing the marvels of the universe. But cold and menacing is the other hand, which can cut down entire species with ease. The dualism of the double-edged sword holds true in forensic science where the enforcement of justice is balanced by forensic evidence. Forensic evidence has the power to exonerate or implicate an individual as being associated with a crime scene. As forensic scientists, we share in the burden and responsibility of upholding the balance between this duality of Lady Justice's metonymic tokens.³ The double-edged sword, symbolizes the *power* of reason and justice, which can be used defensively as well as offensively, but cannot be wielded without the weighing of the evidence upon the scales.³ Balancing this duality, as Knox poignantly assesses, requires great skill and finesse.³ A criminalist exercises such skill and finesse on the witness stand where they are called upon to be the advocate for the evidence. The CAC Code of Ethics is a great resource on how to manage this delicate balancing act of court proceedings. The criminalist has a *moral obligation* to see to it that the court understands the evidence as it exists and to pres-

ent it in an impartial manner.⁴ A moral obligation, thereby we are bound to uphold this role in the criminal justice system.

No knowledge is complete or perfect

The National Commission on Forensic Science defines forensic science as "the application of scientific practices to the recognition, collection, analysis, and interpretation of physical evidence for criminal and civil law or regulatory purposes." The crux of the question lies within the "application of scientific practices." How does a criminalist in the modern crime lab under ASCLD/ ISO accreditation with strict work instructions, SOPs and in accordance with quality control/ assurance manuals carry out scientific practices that fulfill the rigors of the scientific method? Perhaps some would argue that confining our field within the barriers of standardization serves only as an impediment to our profession. A system outlined by the National Commission on Forensic Science and the Na-

I believe there to be a huge disconnect in how we individually perceive our roles as forensic scientists and how others perceive ourselves.

tional Institute of Standards and Technology could perhaps stifle creativity and ingenuity under such defined standards and guidelines. Is the only outcome of such a system one in which the criminalistics laboratory is nothing more than a testing facility as Dr. Peter R. De Forest, Greg Matheson, and Faye Springer previously forewarned about in 2010 at the Yosemite CAC seminar? If ever there was a time to be proactive and look beyond the bench, I believe that time to be now. Even now, staring into the face of something that will undoubtedly shape and change the future of our profession, there is still hope. That hope has to come from within.

The increased oversight is often thought of as the enemy of our pure scientific pursuits. I would argue that the oversight would allow us to improve in our understanding of our field, and encourage us to learn from our mistakes. We, like our founders before us and the polymaths long before them, should be emboldened in the face of adversity and forge a new path for the betterment of science. Instead of acting with hostility or worse, abject surrender, embrace this opportunity to shape the future of our profession. We as an organization, as a collective field and with renewed vigor, have to participate and act in partnership with the Scientific Area Committees and with the other oversight entities that seek to define our roles. We know best our weaknesses and the limitations to our methods, and therefore we should be the ones to confront and improve standards. We have to be fearless in our commitment and unified in science. Again, the polarizing voice of Carl Sagan reminds me that the method of science is far more important than the findings of science.⁷ If we strive to improve the methods of our science, we may yet come away from all of this relatively unscathed, and hopefully better. If we instead choose to ignore and do nothing, we will surely find criminalistics an unrecognizable field, an assembly line focused on findings.

Courageous self-assessment

So, what comes next? You may be asking yourself, "What can I possibly do?" Take a look at the Organization of Scientific Area Committees (OSAC) organizational chart and see which subcommittee you fall under.8 Learn what you can about what your subcommittee is discussing and help identify those areas where improvement is needed. Don't resist change but embrace change because, as Greg so importantly pointed out in his first CACNews in 2009, change is integral to life. Remember that the goal of the OSAC initiative is the same as ours, to strengthen forensic science. It's time to embrace our partnership with the National Commission on Forensic Science and NIST, because if we "resolutely refuse to acknowledge where we are liable to fall into error, then we can confidently expect that error—even serious error, profound mistakes—will be our companion forever. But if we are capable of a little courageous self-assessment, whatever rueful reflections they may engender, our chances improve enormously."7

To begin at the beginning¹⁰

When I think about the past 7 ½ years working in our profession, I feel incredibly lucky to serve with my co-workers and with my fellow CAC members. They teach me something new every day, and I am thankful to be surrounded by great people who endeavor in this noble science. Even now, as I transition into my new task as editorial secretary, I have been re-reading and learning from Greg Matheson's editorials. Reading what he shared with all of us, reminded me that the *CACNews* is our forum where we get to discuss our science and other esoteric pursuits. It's an outlet where we can turn to learn, to grow and to hopefully, improve forensic science.

For my first issue of the *CACNews* as editorial secretary, I chose to cast aside any notion of writing an introductory article to test the waters. Instead, I decided to immediately jump into the deep end of the issues facing our scientific community. That's just me. I expect that my decision may elicit some response, whether in support of or disdain for this article, but I welcome your feedback. It is one of my goals as editorial secretary to embolden your voices and evoke conversations. Hopefully, these conversations that I imagine taking place among our members will find their way onto these pages. I know many of you have things to say, and often share among friends and co-workers, but I ask you to be brave and submit them here for the benefit of all.

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Limitations To Reporting Unethical Conduct

A fear-inducing, punishment-oriented culture is counter to the forthcoming and supportive atmosphere required to best cultivate an ethical environment.

The Scenario

Jane works in an ASCLD/LAB-accredited lab. Sam is a criminalist who works for himself. Jane decides that Sam has breached the ethics code of the professional association to which they both belong. Jane considers criminalistics to be a profession that polices itself; that is, each person has a responsibility to neither tolerate nor conceal possible ethical transgressions. So, she feels responsible for seeing that Sam's conduct gets corrected. How can she best accomplish this?

Discussion

Had Sam worked in the same lab as Jane, the path for addressing his conduct might be relatively straightforward. ASCLD/LAB-accredited labs ascribe to that organization's *Guiding Principles of Professional Conduct*. Paragraph five states, in part, "Report to the appropriate legal or administrative authorities unethical, illegal, or scientifically questionable conduct of other laboratory employees or managers."

Jane would have been left to decide on her own whether to report the transgression to management or to legal authorities, but the clause is clear on one thing: she must report the questionable conduct.

Note that the document does not add a clause like, "unless the problem is observed only once, and it is rectified by the observer." As worded, *all* questionable conduct of your lab's employees must be reported. This idea may grate against some people. After all, a small transgression, one that you witness only once and rectify immediately by a private conversation with the offending coworker, seems to be solved with minimal expenditure of resources. Why impinge upon the supervisor's time and the taxpayer's money?

Here's one reason: the coworker could have actually made the same transgression multiple times, each time being corrected by a different colleague who thought it was too small a matter to report. If each individual who had encountered the coworker's transgression had informed the supervisor, then the supervisor, serving as the section's point person, would have had a chance to become aware that this was an ongoing problem that needed to be addressed as such.

I'm a strong proponent of keeping supervisors informed of what goes on in their sections. Their awareness is necessary for cultivating an ethical environment. Yet, for employees to feel free to report all questionable conduct to a supervisor may require a shift in culture. Such reports often take on the dark specter of getting someone in trouble. A fear-inducing, punishment-oriented culture is counter to the forthcoming and supportive atmosphere required to best cultivate an ethical environment. The latter may more easily be achieved by managers and supervisors who assure and show employees that reports of questionable conduct will be received with a focus on correction and moving forward, and with sensitivity to any potential embarrassment and fear. Managers and supervisors might best receive reports with humility and compassion, recognizing that anyone, including themselves, can err. This needs to be balanced against their responsibilities to ensure the justice system and the public of the quality of the work product. They might say: yes, we will be compassionate, supportive, and constructive in response to your report, but that doesn't mean the correction can't include firing or arrest.

But, alas, Sam does not work in Jane's lab. Both do, however, belong to the same professional association. Jane could pursue ethics allegations through that entity. But, is she ethically required by that association to do so? That depends on the association. That question was examined in detail in the 2011 Second Quarter issue of this series (see http://www.cacnews.org/news/2ndq11.pdf, pages 15-16).

Regardless of whether her association requires Jane to report the transgression, she believes that it is her responsibility. So, she files ethics allegations; the ethics committee investigates; the board votes, finds Sam guilty, and levels sanctions; and Sam sues the association and Jane. A typical professional association insurance policy might cover the legal fees of any one acting in an official capacity for the association: the ethics committee members who investigated the allegations and the board members who voted on Sam's guilt or innocence. But, such policies typically do not cover a mere member who has filed allegations. In those cases, the accuser must find other ways, sometimes out of pocket, to cover legal

fees, which could be extensive. In short, Jane reports Sam to comply with either the association's ethics or her own sense of ethical conduct, and in return gets to pay tens of thousands of dollars out of pocket in legal fees, not to mention getting to suffer years of mental anguish while the case is pending.

Perhaps that is why so many associations' ethics documents do not require their members to report unethical conduct—it is too heavy a burden to place on individual members.

Yet, there is something sadly ironic when forensic science associations do not require members to report unethical conduct. I always ask my students, "Who polices our profession (as opposed to who enforces our ethics)? That is, who is like the cop on the beat (as opposed to: who is like the justice system)?" The overwhelming response is always an emphatic, "We do." The consensus is that each of us is responsible for taking measures to counteract any potential ethics transgressions that we encounter. That was Jane's stance, too. Yet, a great many associations leave this concept out of their ethics documents, perhaps, as suggested above, to relieve their members of the terrible burden of liability. That's nice of those associations. But, what does this say about who they think polices the profession? For these associations, who is the cop on the beat? No one.

Our system is broken. Addressing ethical transgressions by reporting them may work within an ASCLD/LAB-accredited lab, when both the complainant and the accused work in that lab, and when those in positions of authority are kept informed. It may work within a professional association if the complainant does not realize his or her liability risk (or is an officer of the association and insurance happens to cover legal expenses) or the accused chooses not to sue. Outside of that, the system for reporting and correcting ethical transgressions either does not work or does not exist.

NAS Report Recommendation #9 calls for a national code of ethics, mandatory certification to practice in forensic science, and enforcement of ethics through pulling of a transgressor's certification. Perhaps a system similar to legal or medical licensing will eventually be put in place. If so, that will not occur for several years. Meanwhile, it is important that practitioners and associations realize the limitations of our current system in order to take measures to address them, and, at the very least, to avoid the emotional pain and financial strain of litigation.

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

Lessons Learned? How Allegations of Unethical Behavior May Lead to Changes for the CAC

Adam Dutra CAC Ethics Committee

Public interest in crime laboratories has remained strong since the inception of CSI and other popular forensic science related television programs. In early 2010, a high profile allegation of illegal acts by a member of the California Association of Criminalists (CAC) led to a heightened awareness of potential unethical conduct by criminalists in our organization. This has resulted in an unusually high level of activity by the CAC Ethics Committee over the past five years. It is important to note that during this time period, no CAC member was ultimately determined to have violated the code of ethics. During the course of evaluating and investigating several allegations of unethical behavior, the Ethics Committee and the Board of Directors noted several areas of the process that could be improved. In light of this, the Ethics Committee was tasked in December 2013 with reviewing the code of ethics and the code of ethics enforcement procedures and making recommendations for possible revisions to these documents.

Professional ethics have been an important part of the CAC since its founding. One of the objects and purposes of the organization, as listed in the CAC bylaws, is to "establish, maintain, and enforce a code of ethics for criminalists". In keeping with this purpose, the CAC first approved their code of ethics in 1957, three years before the AAFS adopted their code. It is generally considered one of the more detailed codes of professional conduct in forensic science and has served as a model for several other professional organizations and agencies. All CAC members agree to abide by the code of ethics, but, unfortunately, many fail to even glance at this important document after becoming members. As I stated in my "Presi-

dent's Desk" article in the 3rd Quarter 2010 issue of the CAC-News (http://www.cacnews.org/news/3rdq10.pdf), I recommend that CAC members periodically review the bylaws and the code of ethics, which can be found on the CAC website: http://www.cacnews.org/membership/handbook.shtml.

A code of ethics serves little purpose if there is no means to enforce it. As such, the CAC adopted detailed code of ethics enforcement procedures in 1980. The procedures can be found with the bylaws and the code of ethics, and are summarized here. An allegation of unethical conduct may be submitted by any individual, member or nonmember, to the CAC president. If the president determines that the allegation does not warrant further investigation, the matter can be discontinued with concurrence by the president-elect and the Ethics Committee Chair. One such cause for discontinuance could be that the allegation is against an individual who is not a CAC member. If the president determines that the allegation warrants further investigation, they shall forward the allegation to the Ethics Committee.

The Ethics Committee is the only standing committee specifically mentioned in the bylaws. The three members of the committee conduct a thorough investigation, sometimes taking hundreds of hours. A detailed report is provided to the Board of Directors indicating the allegations, the facts of the case, supporting documents, whether there is sufficient basis to support the allegation, and, if so, what sanctions the Ethics Committee recommends. The Board of Directors reviews the report and can take one of three paths. If the board agrees that a sufficient basis exists that one or more violations of the code

I imagined a scenario where a member admitted that they committed the alleged acts, was repentant, and was willing to receive the recommended sanctions. Should the member still have to undergo an Ethics Hearing?

of ethics likely occurred, they can arrange an Ethics Hearing. If the board cannot agree that an ethical violation likely occurred, they can dismiss the allegation. A third avenue is a Procedural Termination. The board can agree on this option if they believe that the events which led to the allegation have been dealt with in a constructive manner in accordance with code of ethics section V-F, which suggests that "other appropriate corrective measures" may allow a criminalist to remediate the ethically questionable activity. It is my opinion that such corrective measures should be conducted proactively, not merely as an effort to avoid further scrutiny and an Ethics Hearing.

The Ethics Hearing has two parts: the accusation phase and the sanction phase. During the accusation phase, the Board of Directors reviews the allegations and evidence pertinent to the case; witnesses may be called to testify. After hearing all evidence, the board decides whether a violation of the code of ethics actually occurred. If one or more ethical violations is deemed to have occurred, the board decides on the appropriate punishment during the sanction phase of the hearing. The findings at the Ethics Hearing can be appealed by the accused to the "general membership" of the CAC, who can vote to accept or overturn the findings or alter the sanctions.

The hearing is similar in format to a trial. A moderator, usually the Ethics Committee Chair, acts like a prosecutor by providing evidence and witnesses to support the allegations. The accused or his counsel serves the role of a defense attorney. The President acts in a similar capacity as a judge, determining what evidence and witnesses are appropriate for consideration. The remainder of the Board of Directors has the role of a jury, determining whether a violation exists and what punishment is to be given. Any CAC member can attend an Ethics Hearing. Although a number of members expressed interest in the progress and the results of the most recent Ethics Hearing, only a handful of members attended, in spite of the fact that it was held concurrently with a CAC seminar.

Thankfully, few allegations of unethical conduct have resulted in an ethics hearing. This past year was typical in that the President received no allegations against members of the CAC. Although most ethics related matters are intended to be kept confidential, some brief information exists in the CAC meeting minutes to shed light on the frequency of ethical complaints. A review of past records indicated that from 1999-2009, there were three allegations of unethical conduct against CAC members, all of which were dismissed by the President. Things changed substantially in early 2010.

Drug testing at the San Francisco Police Department crime lab was abruptly halted in March 2010 due to allegations of employee cocaine theft. The accused criminalist had already resigned from SFPD prior to this information becoming public, but was facing criminal charges. Due to questions regarding the analyst, the laboratory, and evidence integrity, hundreds of drug cases were dropped by the District Attorney. The scandal made national news and was cited as a reason to increase oversight of crime laboratories. That April, the CAC President received an allegation of an ethical violation on the part of the criminalist and forwarded the allegation to the Ethics Committee. Coincidentally, I became the CAC Pres-

ident a few weeks later. The accused criminalist decided to terminate their membership in the CAC prior to the completion of the ethics investigation. In accordance with the code of ethics enforcement procedures, I issued an Order of Exclusion against the former member.

In the end, it may have been fortuitous that the criminalist resigned during the investigation. Although the cocaine theft was repeatedly reported in the news, I do not believe that journalists are the proper sources for facts in an ethics investigation. I question whether the SFPD would have disclosed information to the ethics committee in a timely manner during the criminal investigation and trials, which lasted until the former member pled guilty in 2013. As details about the case emerged, it was reported that the criminalist had been previously convicted of misdemeanor domestic violence while employed by the SFPD crime lab. This conviction had not been disclosed to defense attorneys or to the CAC. The CAC bylaws allow for termination of membership following conviction in Article II, Section 5.E, which states, "A member may be expelled from the Corporation following conviction of a criminal offense. Such expulsion would follow official verification of the conviction, exhaustion of all appeals, and a three-fourths vote of the members present and eligible to vote at a regular meeting of the Association".

In my opinion, the term "criminal offense" is unnecessarily vague, providing no guidance regarding whether it is intended to include infractions and misdemeanors or to be restricted to felonies. Additionally, in some cases, the requirement that all appeals be exhausted may completely prevent enforcement of this section, because relief under habeas corpus laws can occur long after all other appeals have been exhausted. Although revision to this section should properly be handled by the Bylaws Committee, the Ethics Committee did make recommendations to revise this section. At the Spring 2015 seminar, the Board of Directors submitted to the membership the following proposed revision to Article II, Section 5.E of the CAC bylaws:

- A member may be expelled from the Corporation following a conviction of a criminal offense. For the purpose of this section, the term "criminal offense" shall mean an offense for which the actual sentence or sentencing guideline includes the possibility of incarceration for any period of time. Such expulsion would follow verification of the conviction, exhaustion of all appeals, and a three-fourths vote of the members present and eligible to vote at a regular meeting of the Association.
- A member shall notify the president in writing within 90 days of any conviction of a criminal offense.
- In the event of a successful appeal of the underlying conviction of a criminal offense, the member may apply for reinstatement of membership by a three-fourth vote of the members present and eligible to vote at a regular meeting of the association.

These proposed changes attempted to clarify that "criminal offense" is intended to apply felonies and misdemeanors, removed the requirement that all appeals be exhausted, allowed for reinstatement following successful appeal upon approval of the members, and required members to inform the

president if they were convicted of an applicable criminal offense. Some members objected to each of the proposed changes. After a lively discussion, the members decided to postpone further debate on the proposed changes until this fall.

A second ethics allegation was submitted in the fall of 2010. Unlike the previous case, the details of this and the following case were not the result of circumstances that were widely published. A lengthy investigation was conducted, requiring several extensions and thousands of dollars of subject matter experts. The Board of Directors ultimately decided to issue a Notice of Procedural Termination, believing that, whether or not the allegations were sufficient to be considered a violation of the code of ethics, the matter was deemed to have been dealt with in a constructive manner.

As president, I did not conduct the investigation, but knew the allegations and some general facts. I had time to think about the process of the enforcement procedures and how they might play out under several scenarios. I imagined a scenario where a member admitted that they committed the alleged acts, was repentant, and was willing to receive the recommended sanctions. Should the member still have to undergo an Ethics Hearing? This would seem to make the process burdensome for all involved, drag the case out longer than necessary, and add to the public disgrace of the member who would like to put the matter in the past. I believed that in such a case, it might be preferable to accused criminalists if they had an option similar to pleading guilty to a violation of the code of ethics; however, I did not fully work out the details of this process. When the Ethics Committee was tasked to revise the code of ethics and their enforcement procedures, more thought was given to this idea.

A key issue is to ensure that a full investigation is conducted so that the matter is given the attention it is due. During their investigation, the Ethics Committee may uncover additional sections of the code of ethics that appear to have been violated. The Ethics Committee also makes recommendations regarding the appropriate sanctions for each of the sections they believe have sufficient basis to support the allegation. The proposed changes allow for the "guilty plea" to occur only after the Ethics Committee finalizes their Report of Investigation and the Board of Directors agrees that there is sufficient basis to support a violation of the code of ethics. If the accused member agrees that they violated the specified sections and is willing to accept the recommended sanctions, he must notify the president. The Board of Directors must approve of the agreement, or the process proceeds to an Ethics Hearing.

I was involved with the first two allegations, because I was CAC president during their investigations, but a third allegation of unethical conduct was brought against a member in mid-2012, when I was neither on the Board of Directors nor on the Ethics Committee. As with the previous example, there were many facets to this allegation, and the investigation was lengthy, requiring several extensions. After reviewing the Report of Investigation, the board determined that a basis existed for consideration of an ethics violation and scheduled the first Ethics Hearing in decades. The hearing lasted a full day, and eventually the board determined that no ethical violations were demonstrated by clear and convincing proof.

Several issues arose out of this case. It appeared that some of the allegations were misunderstandings or misinterpretations of the code of ethics by the accuser. There was confusion whether the preamble to the code of ethics may be cited in an ethics allegation. Proposed changes to the code of

ethics procedures were submitted in an attempt to specify what sections of the code of ethics can be cited and to give the president more guidance to clarify the allegations and the applicable sections of the code of ethics. From the information that was presented at the Ethics Hearing, it appeared to me that the accuser requested that a report not be issued, but then cited the lack of an issued report as evidence that the work was conducted under "secret processes". Issues of attorney-client privilege also were raised, but these appeared to involve a difference in opinion as to how broadly and to whom this privilege is extended. The Ethics Committee recommended changes to the code of ethics in an attempt to address these issues.

Because this was the first Ethics Hearing in a very long time, there were a number of procedural issues that could be improved. For example, when the Notice of Ethics Hearing was issued by the president, the accused could not attend on the date that was initially selected, requiring the selection of a new date and the reissuance of the notice. Questions arose regarding who could be present at the hearing, who could be excluded, and who could be called as witnesses. Because of the amount of documents and the length of the hearing, suggestions were made to the Ethics Committee that one or more assistants would help the hearing proceed more smoothly. Proposals to address these and other procedural issues were submitted to the Board of Directors.

Questions were also raised regarding confidentiality of the process. Members are required to assist the Ethics Committee in their official fact finding capacity, if requested to do so. The Report of Investigation lists all of the members who were contacted, when they were interviewed, and the declarations that were generated as a result. Concern was expressed to the Ethics Committee that this might make members less forthcoming and may open the members to repercussions from the accused or the accuser. It was noted that if the Ethics Committee or the Board of Directors cleared the accused member of the alleged violation, there would be no need to breach the confidentiality of the witnesses. The Ethics Committee proposed that some of the information provided in the Report of Investigation be removed to a supplementary document that would be provided to the accused prior to the Ethics Hearing.

The proposed changes to the bylaws, the code of ethics, and the code of ethics enforcement procedures have been approved by the Board of Directors and will likely be brought to the members for a vote at the Fall Seminar. In the interim, I hope that members will refamiliarize themselves with these important documents. Because there are many proposed changes, I anticipate that debate on some or all of the recommendations will be lengthy. Although few members have actively participated in similar online discussions in the past, a forum for discussing these proposals will be present on the CAC website, likely on the secure membership side. The Ethics Committee and the Board of Directors value your opinions, and welcome member feedback, whether via online discussions, emails, or at CAC meetings.

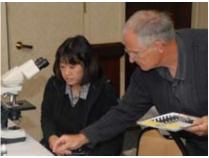
As a final thought, I would like to thank the current and past members of the Ethics Committee. Although they were instrumental in crafting the proposed changes that led to this article, the thoughts expressed here are my own and may not reflect their opinions.

Ventura 2015 TALES

Live men and women tell tales, too, and they were told with flair at the May CAC Seminar hosted by the Ventura County Sheriff's Forensic Services Bureau. The busy week opened with an assortment of workshops offering something for everyone. If you missed them stay tuned for Fall in San Mateo!



This page: Identification of Semen and Other Bodily Fluids workshop, Ed Jones. Facing page: (top) Alcohol Drinking Study driving simulator, (middle row, l, center) Testing and Toxicology of Designer Drugs; (*middle row, r*) DNA Workshop: Mixture Interpretation and Probabilistic Genotyping; (bottom row, l) Microscopy of Hair for DNA Analysis, Skip Palenik; (bottom row, r) New Crime Scene Technologies, Meiling Robinson, Jason Kwast, Eucen Fu and a mannekin; (not pictured) Analysis of Designer Drugs Using Complementary Analytical Techniques.



















Home on the Range

Song Wicks and Jim Roberts organized a day-long workshop at the Ojai Valley Gun Club where they coordinated with a high-speed video equipment vendor. Questions were answered such as how many water balloons does it take to stop a bullet? (see photo) They took their best shots and scrutinized the results on digital playback. (Look for Luke Haag's related presentation in the next issue.)

















(above) Emily Orbach, Trevor Booth and Jade Gibbons man the Registration Desk while Seminar Chair Regina Davidson chats with CAC President Greg Laskowski (below).













(bottom) The Wednesday general session opened with introductions by our vendors, without whom there would be no meeting!













(*l-r*) Paul Dougherty, Michelle and Eric Halsing chat with author Ed Nordskog.





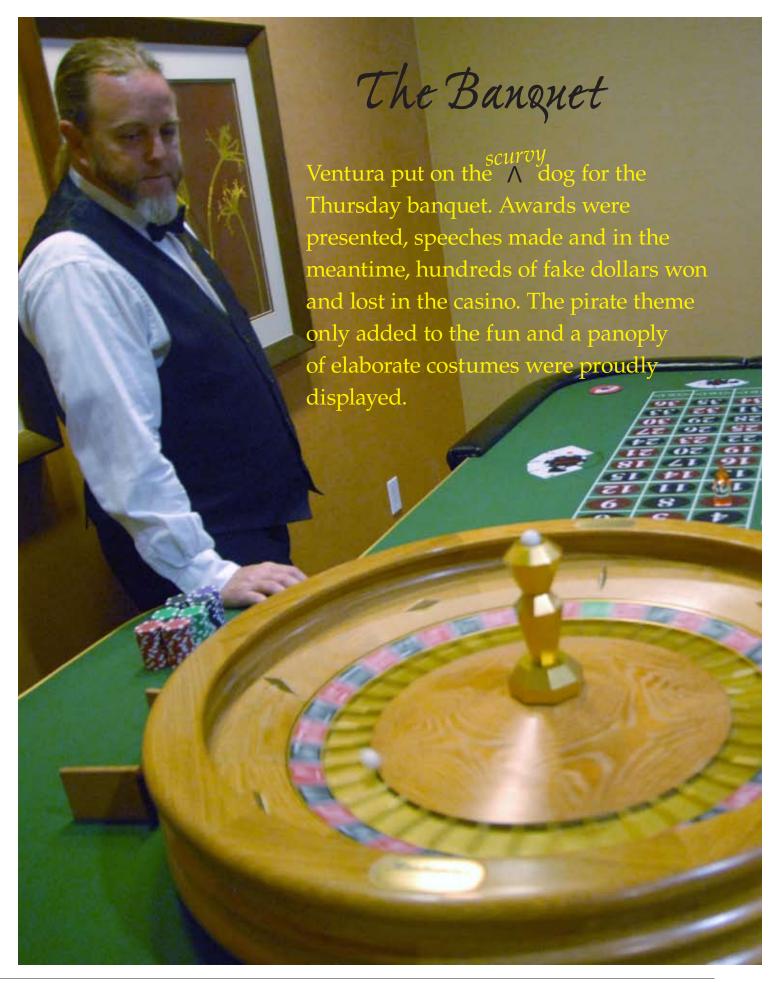




























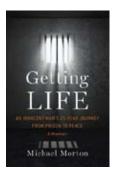


Getting Life:

An Innocent Man's Journey From Prison to Peace

By: Michael Morton

Book Review by Greg Matheson



In a previous issue of the CAC-News I reviewed the book Picking Cotton that told the story of the wrongful conviction of Ron Cotton. He was positively identified by Jennifer Thompson as the man who raped her. DNA eventually proved he was not the assailant and Jennifer had to live with her role in his conviction. She and Ron eventually became friends and worked together to share their story, including being the keynote speakers at the 2014 CAC fall seminar in Rohnert Park. It was an

interesting and gripping story that impacted everyone in attendance.

Meeting both Jennifer and Ron fueled my interest in reading the stories of others who were wrongfully convicted so when I heard about the book Getting Life: An Innocent Man's Journey from Prison to Peace (Getting Life), I immediately added it to my reading list. Getting Life is written by Michael Morton, a man wrongfully convicted of murdering his wife and spent the next 25 years of his life in prison.

In both Picking Cotton and Getting Life, the wrongful conviction was not due to faulty forensic science, though DNA had a hand in both cases in helping to prove a miscarriage of justice had occurred. Where Picking Cotton focused on the problems associated with eyewitness testimony, Getting Life tells the story of local law enforcement and prosecution creating a case where none existed, including hiding exculpatory evidence which was eventually used to catch the real killer.

Getting Life is a well written book chronically, following Michael Morton's life from father and husband, to accused

murderer, to prison inmate, to celebrated survivor. Just a regular guy, living a regular life, he walks the reader through the nightmare that became his life and the dedicated people who helped bring the nightmare to an end. Through his words, he shares his struggles to hold his life together hoping that justice will eventually prevail. One of the very striking and scary thoughts this book delivers is that it probably would never have been written if, instead of getting life, he had received the death penalty.

Getting Life has very little forensic science but should still be read by every forensic scientist. When I started as a criminalist with the LAPD it was a common belief that if someone made it through the criminal justice system and was found guilty, then they were either guilty of that crime, or "were guilty of something," and deserved what they got. I would like to think we have all moved past that way of thinking. Reading this book is just another reminder of how important it is for forensic scientists to be advocates of the evidence, and only the evidence, and to always do the best job possible because we are the ultimate gatekeepers of the truth.

For those of you who would rather watch TV than read the book, the documentary An Unreal Dream: The Michael Morton Story tells the same story as the book but in just 90 minutes. It's not as detailed as the book but in the video you get to hear the story directly from Michael Morton's mouth. Or better yet, read the book and watch the video, they compliment each other well.

Hardcover: 304 pages

Publisher: Simon & Schuster (July 8, 2014)

ISBN-10: 1476756821 ISBN-13: 978-1476756820

FEEDBACK -----

Upcoming Bylaw Change

At the Spring 2015 business meeting I listened with interest to a proposed bylaw change. Among the issues discussed was a change in language to the effect that if a member were expelled from the association following conviction for a criminal offense he or she would need to be voted back into the CAC in the event their conviction was overturned on appeal.

This offends my sense of fair play. If the underlying basis for the an expulsion falls, be it for legal, technical or factual reasons, then I think the outgrowth of the original basis should also fall. *But for the conviction*, the member wouldn't have been expelled. I believe the member should be automatically reinstated rather than suffer the added humiliation of

waiting to see if the membership will have him or her back. There is no reason for the membership to second-guess the court and decide if they are still unhappy with the decision, or that they don't like the member or that they still don't think justice was done.

I realize that some attorney's professional codes of conduct require a reapplication to practice law if one is disbarred and successfully appeals, I'm simply offering my opinion about the CAC.

This issue is slated for discussion and a vote at the San Mateo meeting in a few months. Please consider the question and vote accordingly.

—John Houde



So You Want to Get Into Forensic Science?

Commentary by Bob Blackledge

When I retired in May, 2006, I applied for and gained a position as a speaker for the American Chemical Society. I've been an ACS member for over fifty years. The speaker job doesn't pay anything, but my expenses are covered as (at the request of local ACS sections) I travel to various U.S. cities to be the featured speaker at local ACS section meetings.

Often at these meetings I'm queried about how to find a job in forensic science. So not wanting to give bad advice, I often think about how to answer. I very strongly feel that all too often today, we are preparing students for jobs that will not exist in the future. If you've truly received an "education" rather than being "trained," you may have the tools to adjust as the job market changes. But wouldn't it be better if those advising you could (although looking through a glass, darkly) envision and anticipate the job market of the future? So here are some of my thoughts about what areas of forensic science in the near future will be diminishing and which areas will be expanding.

Diminishing (or at least increasingly becoming automated and performed by low-paid technicians):

Latent prints. Still will need those knowledgeable to locate, develop, and record latents at crime scenes, but developed print enhancement, search, and comparison will increasingly become automated.

Serology (or DNA). Routine DNA casework will become more and more automated. Most DNA sections in your typical small crime lab will mostly have low-paid technicians who examine physical evidence and prepare the samples for the automated instrumentation. The head of the section will have a PhD in molecular biology and will usually be the person giving expert witness testimony.

However, in large regional labs, large commercial labs, and some university research settings there will be positions requiring a PhD. These labs will do research and also examine evidence that small crime labs have outsourced to them. They will do things like mDNA, touch DNA, plant DNA, as well as future advances I can't anticipate.

Drug chemistry. Technicians will examine suspected contraband and paraphernalia and prepare samples for introduction into instruments that are highly automated, very versatile, and produce identifications and quantifications that are so accurate and precise (all supported by past performance and results on blind proficiency tests) as to be difficult to challenge. A PhD chemist will supervise the section and most often provide expert witness testimony.

Blood/breath alcohol. Forget about it!

Questioned documents, firearms and tool marks, impressions, fracture matches. Will still be needed but examinations will be far less subjective and conclusions must be supported by statistics and large searchable databases.

Expanding (or newly-developing areas):

Computer Crime. Expanding daily and will continued to expand.

Microbacterial Forensics. The following list of articles and websites where they may be found make my case for me. Those working in small crime labs may not run these assays, but when processing crime scenes they will have to know how to locate, collect, and package evidence having potential for microbacterial analysis.

Bacterial forensics: Tracing a suspect from the microbes on their shoes, May 11, 2015, http://phys.org/news/2015-05-bacterial-forensics-microbes.html#nRlv

Bacteria on shoes could help forensic teams catch suspects, May 13, 2015, http://phys.org/news/2015-05-bacteria-forensic-teams.html

New application of classic algorithm uniquely identifies individuals based on their bacterial 'companions,' May 11, 2015, http://phys.org/news/2015-05-application-classic-algorithm-uniquely-individuals.html#nRlv

http://www.pnas.org/content/early/2015/05/08/1423854112

Microbial 'signature' for sexual crimes, Dec 15, 2014, http://phys.org/news/2014-12-microbial-signature-sexual-crimes.html#nRlv

Metagenomic analyses of bacteria on human hairs: a qualitative assessment for applications in forensic science, http://www.investigativegenetics.com/content/pdf/s13323-014-0016-5.pdf [fulltext]

80 million bacteria sealed with a kiss, Nov 17, 2014, http://phys.org/news/2014-11-million-bacteria.html#nRlv

Shaping the oral microbiota through intimate kissing, http://www.microbiomejournal.com/content/2/1/41 [full text]

Microsoft study claims human attention span now lags behind goldfish, http://medicalxpress.com/news/2015-05microsoft-human-attention-span-lags.html [This last one was just a test to see if you were still awake!]

Trace Evidence: Continuing to expand as technology expands. Do you like challenges and to solve puzzles? Hate routine? Trace or either of the two previous areas may be for you. But especially in trace life won't be easy. Those above you in the chain of command have chosen that career path because they love order and validated protocols, and have an innate distrust of anything that's novel or not routine. Trace will never be routine. If you choose the trace route you certainly won't die of boredom! However, you will have a continual battle with administrative higher ups, QA/QC types, and ASCLD Lab. But if you perform your work consistently adhering to the highest scientific standards, you will believe in yourself, and easily defend your work and findings whether before ASCLD Lab inspectors or Daubert hearings. At the end of your career you will be able to look back with pride and know that you truly served justice.

Note: The links in the letter should be clickable in the online version of the CACNews.

Who's on First?

- Do ignitable liquids destroy fingerprints in a closed container?
- Does heat destroy fingerprints?
- Does DNA survive a fire?



Arson Analysis

- Does swabbing the evidence destroy fingerprints?
- Does opening the evidence packaging lose ignitable liquids while swabbing for DNA?



- Does glue fuming destroy DNA?
- Does powdering cause DNA contamination?
- Does opening the evidence packaging lose ignitable liquids while fuming?
- If prints are not useable, can they be swabbed for touch DNA?

Fingerprint Analysis

- DNA analysis, fingerprint processing, and arson analyses are mutually destructive;
- i.e. performing one analysis will physically decrease useable data for further testing by other units



Unburned bottle sample:

Determine baseline effects with known quantities

- DNA
- fingerprints
- gasoline

together on unburned glass bottle in sealed, controlled environment

Experimental Design



Unbroken Molotov cocktail with flaming wick:

Determine effects of limited fire applications with known quantities of DNA, fingerprints, and gasoline

Experimental Design



Fully engulfed
Molotov cocktail with
flaming wick and
water suppression:
Determine the effects of
fully involved fire
applications and
suppression efforts
to known quantities of

DNA, fingerprints, and

gasoline

- ~8 ng DNA diluted saliva on mouth of bottle (based on casework samples) and collected with swabs
- Extraction with BioRobot EZ1
- 7500 Real Time PCR Instrument with Quant Duo/Quant Trio Kits
- 3500 Genetic Analyzer with GlobalFiler Amplification Kit
- Controls to monitor efficiency of collection and extraction; yield, contamination, bottle blanks

DNA Analysis

- Amino acid/known sebaceous on paper label/glass bottle
- Alternate/oblique lighting with photography
- Cyanoacrylate fuming
- Black powder dusting
- Soot rinsing

Fingerprint Processing

- · 5 mL gasoline in "S" set
- · ~30 mL (1 oz.) on each wick in "E"/"F"
- Clear nylon evidence bags (Kapak / Arrowhead brand)
- · Passive adsorption at 80°C (176°F)
- Left at room temperature overnight to cool.
- CS2 elution and carrier solvent on Agilent GC 6890N/MS 5973

Ignitable Liquids Analysis

DNA Results, Set S

Samples	Survivability	Total DNA Detected in Swab Average	Total DNA Range			
S1-S6	As-is	2.306 ng	0.011 ng - 8.018 ng			
S7-S12	5 mL of gasoline and heated at 80°C for 6 hours	1.796 ng	0.048 ng - 5.560 ng			
S13-S18	5 mL of gasoline and stored in Kapak for 1 week	1.892 ng	0.010 ng - 5.557 ng			

DNA Results, Set S

Samples	Survivability	Number of Samples with Full Profile	Number of Samples with Partial Profile	Number of Samples with No Results		
S1-S6	As-is	14	3	1		
S7-S12	5 mL of gasoline and heated at 80°C for 6 hours	15	3	0		
S13-S18	5 mL of gasoline and stored in Kapak for 1 week	16	2	0		

- Soot developed many prints that were able to be photographed, not lifted
- Avoid contamination-use disposable brushes, small amounts of new powder
- Use PPE, and sanitize hoods and chambers between samples
- DNA analysis first when appropriate (degraded sample, textured surface)
- Numerical results were inconclusive for workflow; DNA contamination biggest issue

Conclusions from fingerprints

- Swab mouth of bottle, not sides more DNA available in saliva than touch DNA
- · Fire seriously degrades DNA
- Heat from arson testing and the presence of ignitable liquids does not significantly affect DNA results
- Possible post-fire contamination issues with CODIS entry
- Surprisingly low levels of DNA and degraded DNA gave profiles suitable for CODIS entry
- Numerical results were inconclusive for workflow; contamination biggest issue

Conclusions from DNA testing

- Gasoline profiles were hardy when wick (or porous substrate) present
- Ignitable liquids testing (heat and voc's) interfere more with prints than with DNA
- Quick processing is essential for all evidence when voc's are involved
- Package wick and bottle separately for best overall evidence recovery

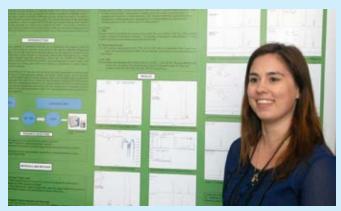
Conclusions from arson analysis

- Molotov cocktails: package wick and bottle separately to minimize interference and personnel exposure to evidence
- DNA first, then prints, then arson analysis in most cases.
 - Not based entirely on experiment results, but serious contamination issues that came up
 - New DNA kits highly sensitive to degraded DNA and low-level DNA
 - Quality and quantity of contaminants hinders CODIS entry
 - DNA unit will need to be globally aware of other evidence to minimize loss of prints & ignitable liquids

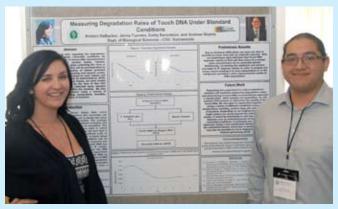
Suggested workflow



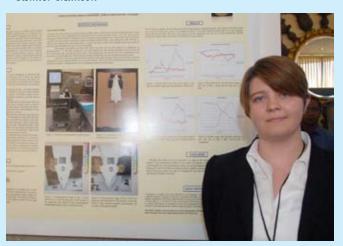
POSTER SESSIONS



Applications of Nuclear Magnetic Resonance Spectroscopy to Identify and Distinguish Stereoisomers of Controlled Substances—*Darcy Kemter-Munson*



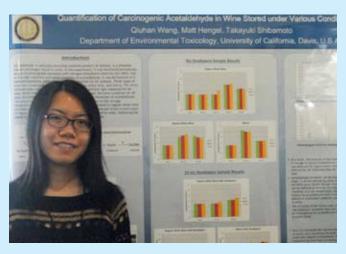
Measuring Degradation Rates of Touch DNA Under Standard Conditions—*Kristen DeBacker & Jaime Fuentes*



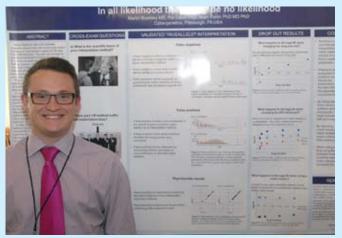
Investigations on the Use of the OxyVu Hyperspectral Imaging System to Determine Time-of-Death— $Genevieve\ Howell$



Detection of Adulterants In Morphine Sulfate Solutions Using UV-VIS NanoPhotometer Instrumentation—*Thomas Sahiri*

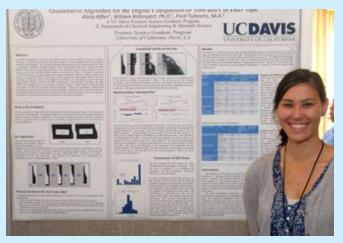


Quantification of Carcinogenic Acetaldehyde in Wine Stored Under Various Conditions—*Qiuhan Wang*

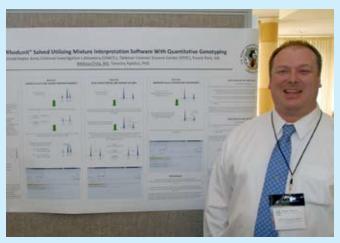


In All Likelihood There May Be No Likelihood—*Martin Bowkley*

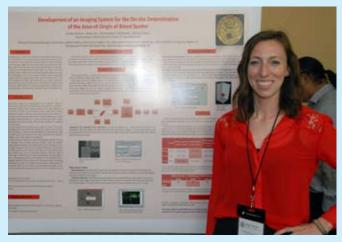
Note: Unattended posters are not shown here.



Quantitative Algorithm for the Digital Comparison of Torn and Cut Duct Tape—*Alicia Alfter*



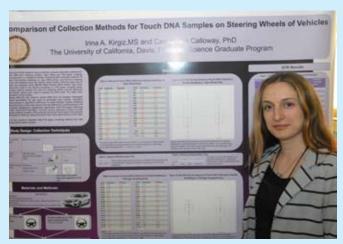
A Whodunit Solved Utilizing Mixture Interpretation Software with Quantitative Genotyping—*Brian Higgins*



Development of an Imaging System for the On-Site Determination of the Area of Origin of Blood Spatter—*Heather Rushton*



A Study to Evaluate Dane's Histological Staining Method to Differentiate Vaginal and Buccal Cells—*Andrew Calhoun II*



A Comparison of Collection Methods for Touch DNA Samples on Steering Wheels of Vehicles—*Irina Kirgiz*



Evaluation of the Effect of Force on the Generation and Detection of Tissue Specific mRNA—*Julian Lis*.

ABSTRACTS

FROM THE

Spring 2015 CAC Seminar

DNA Workshop:

Development of the QIAGEN Investigator 24plex - Global STR Analysis Including Quality Control

Mary Jones Dukes, QIAGEN, Inc

This presentation will focus on the development of the QIAGEN 24- plex STR assay in response to the FBI expanded set of CODIS core loci. Concepts and overview of both the Investigator 24plex QS and the Investigator 24plex GO! Kits will be presented. QIAGEN's design of the novel internal Quality Sensor will be detailed with empirical data of profile success confirmation.

TrueAllele Analysis of Challenging DNA Evidence

Stephan Cico and Martin Bowkley, Cybergenetics

Cybergenetics will present the TrueAllele Casework system and its underlying science. The 1.5 hour workshop will explain probabilistic genotyping through TrueAllele interpretation of DNA mixture evidence. Attendees will survey the forensic process, from data through match. Topics will include genotype uncertainty, mixture weight and likelihood ratios, and validation. Real case examples will include touch and degraded DNA, allelic drop-out, as well as complex mixtures with related contributors or 4 or more contributors.

Workshop participants can e-mail Stephan (stephan@cybgen.com) for information on a free screening of a complex DNA mixture that can be reviewed at the Cybergenetics vendor booth during the seminar.

The Validation and Use of TrueAllele at Kern Regional Crime Laboratory

Garett Sugimoto & Dechelle Smothers, Kern Regional Crime Lab.

The Kern Regional Crime Laboratory implemented the use of the TrueAllele Casework System in October of 2013, and since have interpreted DNA mixtures from more than 40 cases using this probabilistic genotyping software. The internal validation of the software, as well as the implementation and use of the interpretation protocols will be presented. Notable cases and the overall impact on casework will also be discussed.

MiniFiler [Saves/Ruins] The Day!

Eric Halsing, Cal DOJ Jan Bashinski DNA Lab

A DNA presentation about the many successes and occasional failures of using the MiniFiler STR Amplification Kit.

STRmix™ Probabilistic Genotyping at the Defense Forensic Science Center

Philip Nase, U.S. Army Criminal Investigation Laboratory

This workshop presentation aims to detail the successful implementation of STRmixTM at the Defense Forensic Science Center (DFSC) from the examiner's perspective. Attendees of this presentation can expect an overview of the mathematical method used by STRmixTM to perform probabilistic genotyping. Additionally, details of DFSC's validation, training, competency testing and implementation of STRmixTM will be presented. Finally, attendees of this workshop will gain an understanding of the type of samples STRmixTM enables users to interpret, and the success stories as well as the new challenges that have emerged since implementing this powerful tool at DFSC.

Selection and Implementation of Probabilistic Genotyping Software

Kent M. Harman, Genetic Technologies, Inc. and eDNA Consortium

Genetic Technologies, Inc. is a multi-accredited Forensic Biology laboratory undergoing the industry's transition to a majority caseload of Low Template/Mixed Samples. This transition required new statistical tools to make better use of all data. The choice was clear–switch to likelihoods or remain stagnant and ill-equipped. After an exhaustive search and much consideration we elected to move forward with Lab Retriever (LabR) for several reasons:

LabR provides us with the ability to utilize all genetic information detected as opposed to discarding otherwise useful data at numerous loci simply because certain alleles fell below the stochastic threshold.

LabR provides analyst to analyst interpretation consistency in that it eliminates variation in the mixture deconvolution process and the selection criteria regarding which archaic formula to implement (CPI, Modified RMP, 2P).

LabR is one of the few models available that is transparent and does not operate as a "black box" and is therefore easily explainable while testifying. A software development expert from the "Black Box Folks" will not be necessary to explain the calculation processes.

With LabR, the expert is the laboratory analyst – as it should be.

LabR delivers a great tool with the ability to investigate a range of probabilities of drop out and competing hypotheses based on case specifics....with near instantaneous calculation results.

LabR is easily integrated into the existing workflow, LIMS, and report generation process which additionally reduces analysts' interpretation and report writing work load.

LabR provides a great tool with minimal implementation cost (time and money).

Implementation of Lab Retriever in Casework Analysis

Kristine Kadash, Jefferson County Regional Crime Lab

The Jefferson County Regional Crime Lab (JCRCL) serves the community directly west of Denver. In 2014, the lab expanded its facility to include forensic DNA analysis. This work had previously been done by the state lab. With a brand new lab comes the opportunity to set a new course. The latest STR technologies were adopted, including Quantifiler Trio, GlobalFiler, and the 3500 CE platform.

These technologies provided an opportunity to explore more sophisticated interpretation approaches and corresponding statistical methods. Several software options have recently emerged to assist in data interpretation and inclusion statistics. JCRCL selected Lab Retriever for its ability to quickly perform calculations, to incorporate dropout probabilities, and to handle multiple scenarios with assumed, suspected, and unknown contributors. The validation of Lab Retriever focused on two areas: the accuracy of the mathematical functions and the expected range of likelihood ratio values for true and false contributors.

This presentation will detail the elements of the validation and the overall findings. After the validation was complete, Lab Retriever was applied to cases involving mixtures that had more than two contributors, could not be resolved, and/or exhibited possible allelic dropout. Real case scenarios are much different from the simulated samples used during the validation, and they prompted additional questions about how to properly utilize Lab Retriever.

These issues included: how to determine the alleles on which to base the probability of dropout, the effects of allele sharing and masking stutter, how to determine the number of donors, and the impact of having more than one suspected contributor. A few key examples will be provided. Follow-up studies will be conducted to address these additional issues.

An Assessment of the Information Content of Likelihood Ratios Derived From Complex Mixtures

Clare D. Marsden, Norah Rudin, Keith Inman, Kirk E. Lohmueller,* With the increasing sensitivity of DNA typing methodologies, as well as increasing awareness by law enforcement of the perceived capabilities of DNA typing, complex mixtures consisting of DNA from two or more contributors are increasingly being encountered. However, little research has been conducted to determine whether it is possible to distinguish a true contributor from a non-contributor in these complex samples, and under what specific conditions. In order to investigate this question, sets of six 15-locus Caucasian genotype profiles were simulated and used to create mixtures containing 2 to 5 contributors. Likelihood ratios were defined for various situations, including varying numbers of contributors and unknowns, as well as known non-contributors. This resulted in fourteen different sets of hypotheses, each of which was tested with both contributors and non-contributors; each was run 10,000 times through the experimental simulation. These experiments were intended to illustrate the best-case scenario, in which all alleles from the true contributors were detected in the simulated evidence samples. Therefore the possibility of drop-out was not modeled for this experiment. The computer program DNAMIX was then used to compute LRs for all of the experimental conditions, i.e. true contributors (TC) and known non-contributors (KNC), assuming varying numbers of unknown individuals in the mixtures. This resulted in 140,000 LRs for each of the two experimental conditions, which were assessed and compared to the known ground truth input profiles. These complex mixture simulations show that, even when all alleles are detected, (no drop-out), TCs can generate LRs less than 1 across a 15-locus profile. However, this outcome was rare (7 of 140,000 replicates (0.005%),) and associated only with mixtures comprising 5 contributors in which the numerator hypothesis includes one or more unknown contributors. For KNCs, LRs were found to be greater than 1 in a small number of replicates (75 of 140,000 replicates (0.05%)). These replicates were limited to 4 and 5 person mixtures with 1 or more unknowns in the numerator. Only 5 of these 75 replicates (0.004%) yielded an LR greater than 1,000.

Thus, overall, these results imply that the strength of evidence that can be derived from complex mixtures containing up to 5 contributors, under a scenario in which no drop-out is required to explain any of the contributors, is remarkably high. This a useful benchmark result on top of which to layer the effects of additional variables, such as drop-out, contributor ratios, shared alleles, and other variables.

Another Questionable Y-STR Profile Interpretation: The Story Continues ...

Norah Rudin, Ph.D., Forensic DNA Consulting

At the Fall 2014 CAC DNA workshop, attendees heard the story of the post-conviction exoneration of Claude Brooks in Cook County, IL. Central to the case of Mr. Brooks was a questionable Y-STR profile interpretation. One of the questions asked by an audience member was whether the laboratory had changed their interpretation procedures based on the criticism they received.

Another Y-STR case from this jurisdiction will be presented. Issues that will be discussed in connection with the interpretation of this complex profile include: amplification of homologous sequences on the X chromosome, criteria for determining if a peak is an artifact, criteria for determining the number of contributors (including consideration of male relatives), statistical calculators, interpretational bias, relating validation to casework, disclosure of communications, and reporting of conclusions.

Workshop participants will receive a copy of the electropherogram prior to the session so that they can perform their own blind interpretation of the profile before the presentation.

General Session:

The Role of Forensic Microscopy in the Solution of the Green River Serial Murders

Skip Palenik

The Green River Murder Case was, in terms of the number of victims involved, the largest serial murder case in U.S. history. At the height of the investigation, it was believed that the killer had murdered between 64 and 104 young women. After nearly 20 years, a suspect named Gary Ridgway was arrested and charged with four of the murders based on DNA evidence. Ridgway steadfastly denied his guilt and the prosecution turned to trace evidence for help in determining if there was any connection to the many other victims that had not been charged to him.

Microscopic evidence, two orders of magnitude smaller than the particles the police had been working with, was discovered on the remaining clothing of several of the as yet uncharged victims. The particles were microscopic spheres of spray paint of an unusual chemical composition. The story of how these particles were located, isolated and analyzed to identify their source and how this information ultimately led directly to the confession of Ridgway to 48 of the murders will be described in this presentation. The little known story of how Ridgway was very close to being tracked down within three years after the first victims were discovered by these same particles will also be explained as a reminder of the often unrecognized value of properly analyzed microscopic trace evidence as investigative aids in serial crimes.

SPRING ABSTRACTS

Update of OSAC—the Organization of Scientific Area Committees

Mark D. Stolorow

The Organization of Scientific Area Committees (OSAC) has more than 500 members including forensic science practitioners, academic researchers, measurement scientists, statisticians, lawyers, judges, psychologists and accreditation experts. The consensus-based documentary standards and guidelines approved for posting on the OSAC Registry of Approved Standards and Registry of Approved Guidelines will be considered by laboratories as standard methods for specific analyses, potential discipline specific standards for consideration by accrediting bodies offering accreditation services in the forensic industry, and officers of the court when evaluating processes employed and testimony given by forensic science experts.

This presentation will update the OSAC infrastructure, membership and operational functions. There are five Scientific Area Committees (SACs) including 1) Biology/DNA, 2) Chemistry/Instrumental Analysis, 3) Crime Scene/Medicolegal Death Investigation, 4) Digital Evidence/Multimedia, and 5) Physical/Pattern Interpretation. There are 24 discipline-specific Subcommittees assigned to the 5 SACs. Over 540 subject matter experts (volunteers) have been appointed to OSAC and the first public meetings to disclose the 2015 action plans were presented at the American Academy of Forensic Sciences Annual Meeting in Orlando, Florida on February 16-17, 2015. An update of OSAC activities will be provided to the CAC membership.

A Laboratory Director's Perspective on Meeting the Defendant's Right to Confrontation of Scientific Witnesses

Dr. Barry Logan

Over the last six years there have been a series of cases from the US supreme court further interpreting the sixth amendment right to confrontation outlined in Crawford v Washington, specifically with respect to forensic science testimony, and revolving around the issue of who does the state need to produce to meet its constitutional burden for confrontation by the defendant of his accusers. The cases, Melendez Diaz, Bullcoming, Williams and Briscoe, all agree that forensic science evidence is testimonial and needs to be introduced by a competent and relevant witness. The US Supreme Court however, has not yet provided a definition of whom that witness is. This has left the forensic science community, and state supreme courts reading the tea leaves and coming up with a patchwork of rulings that have addressed some case specific facts, but lacking any broader guidance. This presentation evaluates the options that laboratories and the courts have for entering scientific reports into evidence, and balances those against day-to-day operational challenges in forensic science; running the lab, supervising and developing people, scheduling work assignments, and managing backlogs and deadlines imposed by court dates. Keeping in mind the truth-finding function of the courts, what are workable solutions that accommodate the defendant's rights, and don't create unmanageable burdens for the lab?

Future of Crime Scenes

Ieff Gurvis

There have been tremendous strides in forensic science and crime scene analysis in the past 100 years in both the sci-

ence and the application of technology. In this lecture, we will explore what current research is being performed and what crime scenes of the future will be like for law enforcement and laboratories.

Regional Inter-Agency Partnership with CODIS

Brian Burritt and Shelley Webster

In this presentation, the speakers will discuss new efforts in the San Diego region that attempt to increase the value of existing DNA testing and CODIS matches. These efforts involve coordination and teamwork between the San Diego Police and Sheriff's laboratories and the San Diego County District Attorney's Office, as well as additional coordination between units within the laboratories.

These efforts include the regular sharing of Suspect's DNA profiles between the two regional crime laboratories, communication of CODIS hit information to the San Diego County District Attorney's office for incorporation into their Case Management System and to allow DA's office follow-up with investigators, and the creation of a single database for cross checking of DNA and Fingerprint matches. The presenters hope to provide information that could inspire similar programs in other jurisdictions.

Meanwhile, Down at the Courthouse...

Michael Chamberlain

This presentation will address current legal issues of interest. Topics may include litigation over arrestee DNA samples at the California Supreme Court, a new state law addressing expert testimony in habeas corpus proceedings, admissibility of psychological diagnosis and expert medical testimony, rape kit backlog legislation, and federal forensic science "reform" efforts.

The OSAC Human Factors Committee

Dr. William Thompson

Human Factors is a field that studies ways to improve human performance, particular on tasks involving complex judgment and decision making. Human Factors is also about improving the efficiency, accuracy and morale of organizations and reducing the potential for error, bias and misconduct. This presentation by the vice-chair of the OSAC Human Factors Committee (HFC) will discuss ways the HFC is working with OSAC subcommittees to address various human factors issues in forensic science, including quality control and error management, reduction of the potential for contextual and cognitive bias, assessing fitness for duty, and maintaining an organizational culture conducive to scientific independence, quality work, and high morale. One focus will be the design of context management systems that can reduce the potential for contextual bias while assuring that analysts have access to all information that is relevant to their scientific judgments.

The St. John Vianney Church Arson

Det. Ed Nordskog

This case study highlights the two year investigation into the massive, \$10 million church arson of the St. John Vianney Catholic Church in Hacienda Heights. It will demonstrate a high level blend of forensic efforts, combined with street detective work and a very unique and sophisticated undercover operation that resulted in the conviction of an incredibly sophisticated arsonist.

Lessons Learned? How Allegations of Unethical Behavior May Lead to Changes for the CAC

Adam Dutra

Over the past five years, allegations of unethical behavior have been filed against a few current and former CAC members. None of these allegations have resulted in a finding of an ethical violation at an ethics hearing. In response to the allegations and issues that came up during the subsequent investigations, the CAC Ethics Committee embarked on a process to review sections of the Bylaws, the Code of Ethics, and the Code of Ethics Enforcement Procedures to determine if changes were warranted. This presentation highlights this review process and provides a preview of possible upcoming changes to these documents.

Combined Autosomal STR and Y-STR Multiplex System

Sara Laber

The PowerPlex® Fusion 6C System is a 6-color STR system for simultaneously amplifying 23 autosomal loci, three Y-STR loci, and Amelogenin. The twenty required (Amelogenin, D18S51, FGA, D21S11, D8S1179, vWA, D13S317, D16S539, D7S820, TH01, D3S1358, D5S818, CSF1PO, D2S1338, D19S433, D1S1656, D12S391, D2S441, D10S1248, DYS391) and three recommended (TPOX, D22S1045, SE33) proposed expanded CO-DIS core loci are combined with Penta D, Penta E, DYS570, and DYS576 to give this system a discriminatory power (PI = 1.80 x 10-32) that is over 108-fold higher than that for the twenty required expanded CODIS core loci (PI = 9.35 x 10-24). With DYS391 and nine autosomal loci being less than 250bp, the additional genetic information obtained with this 27-loci STR system will be extremely useful for analyzing degraded samples, where even a partial profile would be informative.

The DYS391 locus is included in the proposed expanded CODIS core loci for verification of gender in amelogenin null samples. However, it has one of the lowest locus variability values and does not significantly increase discriminatory power. In contrast, DYS570 and DYS576 have two of the highest locus variability values within American subpopulations and contribute more to the system's discriminatory power than DYS391. Additionally, because they are rapidly mutating Y-STRs, DYS570 and DYS576 provide the potential for separating close male relatives and further improving useful information from a single STR analysis. These three Y-STR loci will allow more confident determination of the number of male contributors in complex mixtures without the need for a separate Y-STR analysis, thus saving time and money.

This system is designed for 1ng of optimal input DNA template. The average peak height ratio is over 90% with 1ng DNA template and remains high (80%) with as low as 100pg DNA template. It is very sensitive and is capable of calling 98 \pm 21% (average \pm SD) of alleles with 100pg DNA template. Even with as low as 50pg DNA template, 77 \pm 17% (average \pm SD) of alleles are called. The system is also resistant to very high concentrations of PCR inhibitors. One-hundred percent of alleles are called in reactions containing up to 0.5mM hematin with this system. Improved resistance to humic acid and tannic acid is also observed.

To improve laboratory workflow efficiency, this system is designed for use with both casework samples as well with reference and database samples. Direct amplification of blood or buccal samples on multiple substrate types such as FTA® card, nonFTA cards, and swabs eliminates the

extraction process, which saves time and money. To further save time and improve efficiency, automation methods are available for multiple liquid handling platforms which result in over 95% first-pass success rate and minimizes potential cross- contamination.

Application of Raman Spectroscopy to the Forensic Analysis of Drugs

Dr. Sergey Mamedov

Raman spectroscopy is a light scattering technique used for the identification of compounds. The scattered light which is specific to a particular compound is funneled to a detector enabling chemical identification. Raman analysis has been recognized to have potential for solving a wide variety of problems associated with forensic science.

The purpose of this paper is to demonstrate some of the forensic applications of Raman spectroscopy, in particular, the capability of Raman spectroscopy to differentiate between compounds of similar structure. That is, Raman spectroscopy has the capability of detecting even slight differences in the chemical composition of a compound and, therefore, plays a vital role in helping to determine when drugs for example have been illegally manufactured. In order to illustrate the above mentioned, spectra of the two main forms of cocaine (cocaine hydrochloride and cocaine base) will be highlighted in this paper, as well as the ability of Raman spectroscopy to identify compounds in plastic bags/containers.

Raman spectra will be presented and method development including statistical analysis will be described. It will be shown that commercial software package is available and can provide quick identification of materials whose spectra have been collected in a library, or by comparison of samples that are suspected to be similar.

The Challenges of Evidence Collection

Gina D'Aquilla

Forensic nurse examiners are specially trained to integrate practical nursing with forensic knowledge to collect evidence from victims and perpetrators of sexual assault. Essentially, the human body functions as the crime scene. Appropriate collection and preservation of evidence is of utmost importance. The nurse examiner conducts a thorough head to toe examination to obtain every possible detail, ranging from those visible with the naked eye to detectable only at the microscopic level. As new collection techniques evolve, forensic nurses expend countless hours researching, peer reviewing, and consulting to ensure collection methods are up to date with best practice standards.

There are many obstacles a forensic nurse faces while collecting evidence from a victim. Unfortunately these obstacles may result in poorly collected evidence that may irreversibly damage the overall case. Ensure successful outcomes by understanding the challenges encountered in the acute setting and by fostering better collaborative relationships between the forensic nurse examiner and criminalist.

The Early History of the Ventura County Sheriff's Forensic Science Laboratory and a Brief Look at the Pioneering Contributions of the California Association of Criminalists.

Dr. Peter R. De Forest

The founding of the Ventura County Sheriff/Coroners

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Lab took place in 1957. The first laboratory director was Elliott B. Hensel. At the time William Bill Hill was the sheriff and Dr. Gerald Ridge was the county coroner. The laboratory proper was a former ceramic tiled shower room for resident deputies in an earlier era. It was located in a third floor corner of what was then the Ventura County Courthouse on Poli Street in the City of Ventura. The historic building is now the City Hall for the City of Ventura.

The Laboratory was simple and crude. The laboratory benches and the fume hood were homemade. I was still a chemistry student when Elliott Hensel hired me. I started work toward the end of August in 1960. During the daytime we were the only laboratory personnel. On Saturday I worked alone. The Saturday hours allowed me to have a flexible schedule during the week to accommodate my coursework. At night a medical lab technician was on the graveyard shift to draw blood from DUIs. About a year later, Elliot Hensel resigned to accept a job with the United States Agency for International Development (USAID), where he advised on setting up forensic science laboratories in several nations around the world. Thomas Weiland (from the LASD laboratory) was then hired to replace Elliott as laboratory director. Clearly, by modern standards, the laboratory was extremely low-tech. In addition to microscopes, the most sophisticated instrumentation was a Beckman single-beam UV/VIS spectrophotometer. Toward the end of my first year there we did acquire a packed-column gas chromatograph. The experience in the Ventura lab introduced me to criminalistics and changed the direction of my life. Elliott and Tom were wonderful mentors. I learned a great deal and became aware of Dr. Paul L. Kirk and the Criminalistics Program at the University of California at Berkeley. I discussed some of these early experiences in my Founders Lecture.

I don't have exact figures for the number of forensic science laboratories in the early 1960s, but my understanding at the time was that there were about 30 laboratories nationwide half of which were in California. The California laboratories were set up by the pioneering criminalists who founded the CAC. The CAC has continued their pioneering and visionary work. The contributions of the CAC and its members are legion.

A Momentous and Moving Case

Lucien Haag and Alexander Jason

A recent civil trial arising out of an officer-involved shooting which resulted in a fatality focused on two important issues, a rearward movement of the subject's body purportedly caused by bullet impact and the time required to make an arm movement during the interval between the officer's two shots, both of which struck the subject with one of these shots striking the arm in question.

This presentation will discuss these issues and the methodology employed to make determinations relating to momentum transfer, perception-reaction time and reflexive movements. It will conclude by posing some thought-provoking questions to the attendees regarding the requirements and possible obligations of forensic practitioners who intend to present demonstrative tests in trials.

National & University Laboratories: An Ignored Forensic Science Resource

Bob Blackledge

Billions of dollars of tax payers' money is spent every

year for the operation of national and university research laboratories. This is good! It is essential the United States maintain its edge in technology. However, as far as the examination of forensic evidence (not just research), these resources are today being ignored by the forensic science community. This is not just bad! It is extremely wasteful and does not serve justice. This presentation will examine how this situation came about, how it may be remedied, and provide examples.

DNA Fingerprinting of Cannabis Sativa

Dr. Maria A. Mendoza

Cannabis sativa has been used throughout history for its stems in the production of hemp fiber, for its seed for oil and food, and for its buds and leaves as a psychoactive drug. Marijuana is a cannabis plant with high delta9-tetrahydrocannabinol (THC) content and it is the most frequently used of all illicit drugs in the United States. Short tandem repeats, STRs, provide an excellent method to assess genetic variation owing to their high information content, ease of genotyping, codominancy, high discriminatory power, and reproducibility.

In this study six STR markers previously described for Cannabis were multiplexed into one reaction. The sixplex was able to individualize 98 Cannabis samples (14 hemp and 84 marijuana, authenticated as originating from 33 of the 50 United States) and detect 29 alleles averaging 4.8 alleles per loci. Marijuana and hemp samples are too genetically similar and cannot be distinguished on the basis of the STR genotypes using this sixplex. Samples from the same geographical location (state) did not correlate to each other. Samples with similar cultivation methods, indoors versus outdoors, did not associate to one another. Plants with similar THC content did not group together based on their DNA profile.

The STR sixplex described was found to be reproducible, simple, efficient, and cost-effective. The ability to individualize marijuana samples to such a degree could serve as a forensic tool by using plant evidence in criminal casework and potentially aid in the identification of clonal marijuana, linking the major marijuana growers and distributors. The success of cannabis DNA typing illustrates how botanical evidence could be an added tool for criminal and civil casework.

Ballistic Trajectory Study

Craig Fries

Analysis of the trajectory of shots fired from a single, stationary weapon is often used to pinpoint the location of the shooter, as well as the relative posture and orientation of the target. Previous work by other investigators suggests that any individual trajectory, when traced back from the target to the shooter's location, has an approximate error rate of +/- 5 degrees in predicting the shooter's location. This results in a 5 degree cone of possible shooter locations. When the shooter to target distance is large, the 5 degree cone of possibility can result in a potential area that is so large that making a functionally useful determination of the shooter's location is difficult or impossible. In cases where there are multiple shots fired, the power of statistical analysis can be used to better determine the shooter's location.

The study investigated the ability to predict the location of a shooter's weapon based upon trajectory analysis of multiple shots into a stiff substrate from a single location. The previous claim that the geometric center of the overlapping area of 5 degree cones is the statistically most likely location for the shooter's weapon was tested. In addition, the variabil-

ity and error rates were compared for different calibers and angles of incidence. Laser-aligned trace back was performed on each trajectory rod and detailed with the 5 degree cone. The overlap of these cones was visualized and the known location of the weapon bore compared in 3D to the overlap area, to determine if and how close it lies to the geometric center of the overlap areas. The results will prove useful to the criminalist and ballistics analyst and will provide benchmarks for the variability and precision of these types of measurements common in shooting recreation.

Bloodstain Pattern Interpretation and Time of Death: A Fresh Look at Old Problems

Donald Johnson

This presentation is on current research at CSULA to advance bloodstain pattern analysis and forensic pathology. Three projects will be discussed: 1) the use of miRNA tissue markers to correlate bloodstains with wounds; 2) the development of an imaging system for area-of-origin determination; and 3) the evaluation of hyperspectral imaging as a method to estimate time of death.

Bloodstains can be discovered during the course of an investigation, but their relationship to the crime is in question. The blood is often in low quantities and exhibits non-specific bloodstain patterns. However, we have demonstrated that bloodstains can contain trace amounts of wound cells, which on identification can provide information on the circumstances under which the blood was shed. At this presentation, we will discuss research on the use of miRNA tissue markers to identify wound cells in bloodstains resultant from gunshot wounds and stab wounds.

The area-of-origin of bloodstains can be estimated by the string and tangent methods. However, the methods are laborious and assume straight-line trajectories of blood drops. At this presentation, we will discuss the development of an imaging and computational system for the on-site determination of area-of-origin. The research and development is ongoing, and represents a collaboration between criminalistics and engineering faculty and students. Preliminary data shows the system to be greater in accuracy and speed than the manual tangent method.

Current methods to determine time-of-death are overall inaccurate, and many methods required invasive procedures and laboratory instrumentation. At this presentation, we will discuss our investigations on the use of the HyperMed OxyVu Hyperspectral Imaging System to determine time-of-death. The OxyVu Imaging System is a non-invasive spectroscopic instrument that measures dermal oxyhemoglobin (oxy) and deoxyhemoglobin (deoxy) levels. Human amputation specimens and rat carcasses have been examined with this instrument. One human specimen showed a linear relationship (R2 = 0.9374) between oxy/(oxy + deoxy) values and the time elapsed after amputation over a 58 hourperiod (the last time point collected). Rats examined for a period of four days after death showed a polynomial relationship (mean R2 = 0.9201) between oxy/(oxy + deoxy) values and the postmortem interval. Further research is needed to fully evaluate the application of the OxyVu system for time-of-death determinations.

By a Hair

Bill Haney, Margaret Schaeffer, and Dennis Fitzgerald
This presentation will outline the homicide investiga-

tion of Beatrice Bellis, an 87 year old woman who had been deaf and mute since her early childhood. In the presumed safety of her apartment at a senior living complex in the City of Port Hueneme, California, Mrs. Bellis became the victim of a brutal deadly attack. We will follow the chronological path of this years-long cold case investigation from the perspectives of the lead detective, the criminalist assigned to the case and the Deputy District Attorney who prosecuted the accused killer. This case demonstrates the necessity of crime scene documentation and on-scene evidence collection, proper handling and storage of particularly trace evidence, and serves as an example of the importance of inter agency cooperation and team work in such a situation.

The Simultaneous Processing of DNA, Fingerprints, and Ignitable Liquid Evidence on Molotov Cocktails

Kristin Allard, Kent Adamson, and Kristin Rogahn

The Ventura County Sheriff's Office Forensic Sciences Laboratory commonly receives Molotov cocktails as evidence from arson cases. In an attempt to obtain as much information as possible from each piece of evidence, the arson investigators submit requests for the items to be analyzed for DNA, fingerprints, and ignitable liquids. Our laboratory did not have a documented protocol for which analysis should be conducted first. This study was designed to test the detrimental effects of each analysis on the other types of evidence and determine the semi-quantitative extent to which they occur. With the results, an order of analysis would be determined for Molotov cocktails. Molotov cocktails were created in the laboratory by applying known amounts of DNA, fingerprints, and a gasoline soaked wick to each bottle. The bottles were then separated into three groups: survivability, in which the bottles were not exposed to any fire; self-extinguish, in which the wicks were lit and allowed to self-extinguish; and fire scene, in which the fire engulfed bottles were extinguished with water. Each of these groups was then divided into three subsets to alter the order of analyses and compare results. For DNA analysis, the mouth/neck of the bottles was swabbed with a moist cotton swab. The cotton swab was extracted using the QIAgen EZ1 Advanced XL BioRobot with an elution of 40 µL. The DNA extract was quantified using the Applied Biosystems® Quantifiler® Trio DNA Quantification Kit on a 7500 Real-Time PCR System. If necessary, extracts were concentrated with Microcon Forensic Fast Flow filters. DNA was amplified with the Applied Biosystems® GlobalFiler™ PCR Amplification Kit and analyzed on a 3500 Genetic Analyzer. For fingerprint processing, the bottles were fumed with cyanoacrylate for 15 minutes and then dusted with bi-chromatic powder. Visible fingerprints were lifted onto white fingerprint cards. Some prints were "baked" into the soot on the bottle; these fingerprints were visually evaluated. For ignitable liquid analysis, bottles were sealed in non-porous nylon bags with an activated carbon strip for approximately 6 hours at 80°C. The carbon strip was eluted in CS2 and then analyzed on an Agilent GC/MS. The results of the study showed that fingerprint evidence can be degraded by prolonged exposure to gasoline in a sealed container, such as what is done during ignitable liquid analysis. The quantity of DNA evidence and ignitable liquid evidence both diminished with exposure to the fire, but were not significantly impacted by the order of analysis. Following this study, our laboratory recommended that arson investigators do the following: 1) photograph a Molotov cocktail as collected from the scene, 2) package the wick

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in a sealed, non-porous container for separate ignitable liquid analysis, and 3) package the bottle/bottle remnants in a porous container for DNA analysis of the mouth of the bottle and fingerprint processing of the sides of the bottle. Due to the sensitivity of the new GlobalFiler™ kit, it is recommended that DNA swabs be collected from the bottle prior to fingerprint processing to limit any possible contamination.

New Technologies for the Analysis of Challenging Samples

Gina Pineda Murphy, M.S.

Typically, forensic DNA samples present multiple challenges including limited quality, limited quantity, the presence of PCR inhibitors and issues with result interpretation. These factors make it difficult to obtain interpretable profiles. Therefore, there is a need for more robust, highly sensitive, reproducible methods for DNA quantitation and typing when profiling these difficult samples. Downstream processing decisions, such as targeting amplification DNA amount based on quantitation results and the typing system best suited for a sample based on the quality of the DNA, are crucial in obtaining a typing result from these challenging samples.

We report here utilization of a combination of two recently developed technologies to improve the success rate for obtaining informative results from forensic samples, including highly compromised, degraded and trace samples. A quality/ quantity sample assessment can be effective in determining which typing system to use, as well as how much DNA to take forward to the typing stage with the highest chance of first pass success rates, eliminating the need for repeat analysis.

A new DNA quantitation kit, InnoQuant[™], is designed to generate more accurate and reproducible information about casework samples. This next generation DNA quantitation kit allows accurate quantitation at picogram levels (~1 pg) of two autosomal targets: a "short" Alu based target of 80 bp in size, and a "long" target from a separate retrotransposon of 207 bp in size. The large copy number of the selected targets (>1000 copies/genome) provides high sensitivity while minimizing the effect of variation between individuals, enabling high reproducibility for low level samples. Studies presented will demonstrate the ability of the InnoQuant™ kit to enable confident screening of negative samples and guide selection of optimal downstream typing methods and input DNA target amount, based on the sample's quantitation and degradation index (DI) values.

Additionally, the correlation between quantitation values, DI and profile recovery with property crime samples will be presented.

Once the determination is made for how much DNA to take forward to the typing stage with the highest chance of first pass success rate, several systems are now available to enhance a laboratory's ability to obtain a usable, interpretable DNA profile. One of these systems, the InnoTyperTM kit, is a small amplicon DNA typing system for challenging forensic samples that is compatible with currently used PCR/CE instrument platforms. The system contains 20 Alu retrotransposon element bi-allelic markers, ranging in size from 60-125 bp, making the assay highly sensitive for extremely degraded and/or low-level forensic samples, and enabling recovery of discriminating results from samples that would typically require mtDNA sequencing. The application of the InnoTyperTM system to challenging samples such as rootless hair shafts and degraded skeletal remain samples, will be presented.

Using data generated from multiple studies with real casework samples, this presentation will demonstrate the utility and efficacy of the InnoQuantTM and InnoTyperTM kits to improve processing decisions, prevent the consumption of limited samples, and increase workflow efficiency while increasing success rates with extremely challenging forensic samples.

Study of Criteria Influencing the Success Rate of DNA Swabs Analysis in Operational Conditions: a Contribution to an Evidence-based Approach to Crime Scene Investigation and Triage

Dr. Simon Baechler

DNA is nowadays swabbed every day to investigate serious and volume crimes, but research is surprisingly scarce when it comes to determining the criteria that may have an impact on the success rate of the analysis of DNA swabs performed on different surfaces and situations. In order to investigate these criteria in operational conditions, it was decided to consider retrospectively the analysis results of 4772 swabs performed – using the double swab technique – by the forensic unit of a police department in Western Switzerland over a

3.5 year period (2012-2014) in volume crime cases.

A representative and random sample of 1236 swab analyses was selected to be extensively examined and codified, describing several criteria such as if the swab was performed on the scene or in the lab, the zone of the scene where the swab was performed, the kind of object or surface that was swabbed, if the target specimen was a touch surface or a biological fluid, and if the swab targeted a single surface or combined different surfaces. The impact of each criterion and of their combination was assessed in regard to the success rate of DNA analysis, measured through the quality of the resulting profile (number of loci out of the 16 of the NGM kit; one donor, mixture or not usable), as well as if the profile resulted in a hit in the national database or not.

Results show that some situations lead to a significant increase in the success rate of DNA analysis, indicating for instance that swabs performed on broken window/door handles, on glove prints, or on the surface of stones thrown through windows have a higher success rate than average swabs. Conversely, other situations lead to a marked decrease in the success rate, which should discourage further analyses of such swabs. Results also confirm that targeting a DNA swab on a single surface is preferable to swabbing different surfaces with the intent to aggregate cells deposited by the offender.

Such results assist in predicting the chance that the analysis of a swab performed in a given situation will lead to a positive result. The study could therefore be used to inform an evidence-based approach to decision-making at the crime scene (what to swab or not) and at the triage step (what to analyse or not), contributing thus to save resource and increase the efficiency of forensic science efforts, in particular in volume crime investigations.

Unusual Findings Compounded in a Pediatric Fatality

Jaime Lintemoot

Floating Suicide Deaths

Michelle Sandberg

The History of DNA Evidence and the Rule of Law; Science and the Law, Three Decades, How Has the Law Changed and What Does a California Criminalist Need to Know?

Hon. Christopher J. Plourd

The goal of this presentation is to carry out a historical analysis of the development of Forensic DNA testing as it occurred in the United States and demonstrate the causal interplay and corresponding change to significant legal doctrines in the American judicial system. A review of key legal decisions that have direct application to California criminalist forensic practice will give insight as to how the legal landscape will be evolving in our Golden State. The California criminalist practitioner will learn what new law they need to know as expert witnesses.

The use of DNA evidence has had a profound effect on the adjudication of cases within our adversarial legal system. As a product of the unique power of DNA testing to correctly resolve factual issues, long held legal principals have been reexamined, both legislatively and through decisional law. Forensic Science is simply defined as the application of science to the law or legal matters. Through the scientific method of study, a scientist systematically observes physical evidence and methodically records the data that supports the scientific process. The law, on the other hand, starts out with at least two competing parties who use the courthouse as a battle-ground to resolve factual issues within the context of constitutional, statutory, and decisional law.

DNA analysis has set a high standard against which other forensic sciences are now being judged. Not only has DNA identity testing redefined the standard of acceptability of other scientific evidence, it has also fostered an awareness among juries that non-DNA based identification techniques are less supported scientifically. The 2009 NAS report was critical in its assessment of some forensic disciplines. Lack of research supporting the basic tenets of techniques was noted. The gist of the NAS report was that the admittance of a scientific technique into the courtroom when there is very little to support its validity can have consequences that are

potentially disastrous. As a result of the NAS report efforts are now being made to improve forensic science. The National Commission on Forensic Science and, more importantly for the California forensic practitioner, the Forensic Science Standards Board (FSSB) has been organized to improve the practice of the forensic sciences. The FSSB has started a Guideline and Standard Development process that will strengthen Forensic Science.

The catalyst for DNA's effect on the American legal system was the development and acceptance of DNA identification genetic testing which began in the 1980's. The use of DNA took firm root in the 1990's and was entrenched by the early 2000's. DNA is considered to be the proverbial "gold standard" of biological human identification. DNA profiling over the past three decades was the most significant advance in forensic Science since the development of fingerprinting in the 1900's. New types DNA are being evaluated along with related technologies, notably the continued development and expanded use of DNA data bases. Soon "Rapid DNA testing" technology will be emerging. The DNA revolution fundamentally changed what is Science.

A National Perspective on Forensic Science: How the NCFS Will Impact Our Work

Dean M. Gialamas

The National Commission on Forensic Science was created in February 2013. This unique partnership between the US Department of Justice (US-DOJ) and the US Department of Commerce's National Institutes for Standards and Technology (NIST) formed a new era in oversight of the forensic sciences. Since the first meeting in February 2014, there have been many issues raised and discussed. There have also been formal positions and recommendations that the Commission has voted upon for review by the US Attorney General. This presentation will review the current status of the Commission dealings with a discussion on how this will impact laboratories as well as the bench-level criminalist.



Future Seminars

The CAC Seminar Planning Committee (Eucen Fu, chair) reminds members that the next seminar will be hosted by the San Mateo Sheriff's lab and held at the San Francisco Airport Doubletree, Sept 21-25 2015. Rooms will be \$155/night. The 2016 Spring meeting will be hosted by LAPD which is currently negotiating a hotel contract. Due to north/south swap, the CAC will be holding another southern meeting in the fall of 2016. That meeting will be hosted by DOJ Riverside with a possible joint meeting with ASTEE (trace evidence). For those who like to plan way ahead, the 2017 spring meeting is scheduled to be hosted by San Francisco PD and the 2017 fall meeting by Orange County Crime Lab.

The Art of Edwin L. Jones, Jr.



The art of Ed Jones has graced these pages more than once, but it's always a pleasure to see what he's created lately. Above is an arranged slide he produced for the Microscopical Society of Southern California 2014 Exhibition Meeting. At right is the actual size of the arrangement. The numbers on the photo refer to a key identifying each of the tiny particles. A portion of that key is reproduced below.



"M" Seeds: (Common Name) 1. Knotted Rush, 2. Dudley's Rush, 3. Inland Rush, 4. Monkey Flower, 5. Tetra Vulcan Kalanchoe, 6. Torrey's Rush, 7. Common Rush, 8. Path Rush, 9. Canada Rush, 10. Ditch Stonecrop, 11. Seedbox, 12. Winged Loosestrife, 13. Great Blue Lobelia, 14. Pearly Everlasting, 15. Indian Tobacco, 16. Streptocarpus Weismoor, 17. Pale Spiked Lobelia, 18. Sweet Everlasting, 19. Begonia Victory Scarlet, 20. Dotted St. John's Wort, 32. Butterfly Bush, 35. Culver's Root, 36. Lobelia Palace Blue with Eye, 37. Lobelia White Lady, 38. Red Lobelia Cardinal Flower, 39. Texas Paintbrush, 40. Venus' Looking Glass.

First "S" Gunpowder: 1. FN Brand 5.7 X 28 mm, 2. 44 REM MAG W-W SUPER, 3. Accurate No 5, 4. Accurate No 7, 5. Accurate No 9, 6. Accurate No 2, 7. Accurate Shot Shell 4100, 8. Hodgdon H110 Pistol, 9. Winchester 296 Ball, 10. Accurate 2700, 11. Accurate 2520, 12. Accurate 2230, 13. Hodgdon H380, 14. Accurate 2460, 29. GOEX FFFFG, 33. 38 Spl S&W JHP 125 gr, 35. S.R. No 91 RIFLE, 40. WIN 9 mm Luger JHP, 42. PMC 30 Carbine.

Second "S" Microelectronics "C" Commercial Glitters

"2" Microspheres:

1---7 Commercial beads, 8---12 & 17 hand melted colored glass beads, 13\to-16 glass beads painted by hand, 18. glass bead colored with sharpie marker

"0": Colored printing cut out with a sharpened 25 gauge needle

"1": 1.~100 micrometer cross section of copper wire, 2. #25 Balance timing screw (for watch), 3. Timing washer (for watch) with corrosion, 4. 0.38 mm ball (from ball point pen), 5. ~160 micrometer copper wire, 6. #2 Jewel screw (for watch), 7. Pallet jewel (from watch).

"4": 1. Cross section of Peccary hair, 2. Fine lines on photo film, 3. "6" on photo film, 4. 3 colored fibers mounted between layers of clear tape, 5. Section of 400 mesh brass mounted between layers of clear tape, 6. Cross section of fiber (artificial Christmas tree), 7 thru 9. Cross section of fiber dipped in different colored paints, 10. Cross section of multilayered paint (from automotive spray booth ca 1974). This strip of paint contains at least 60 layers.

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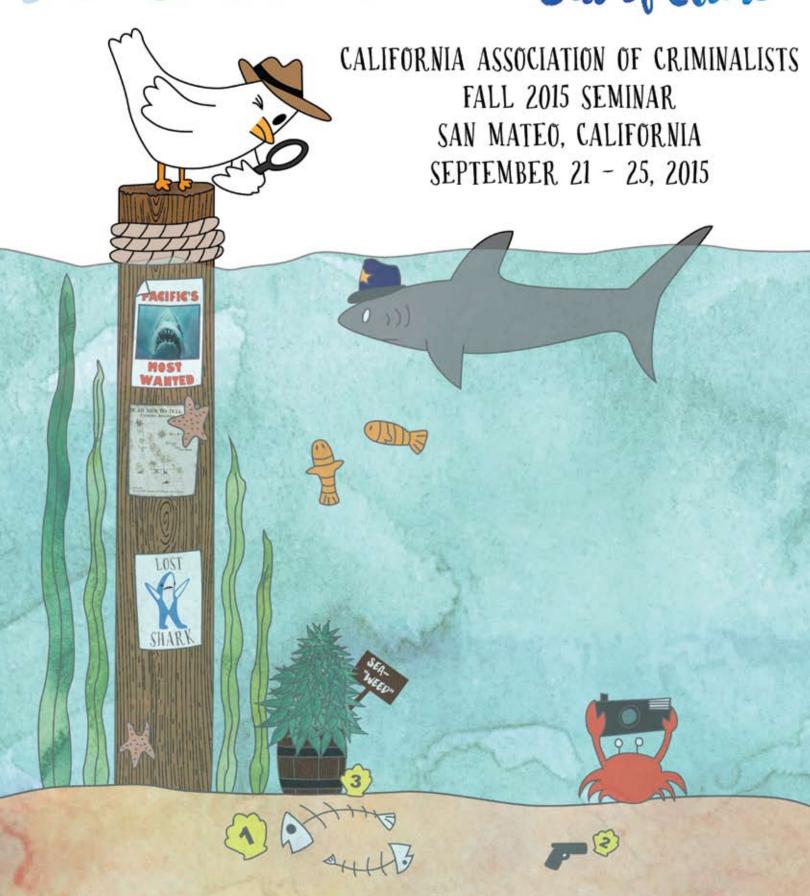




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