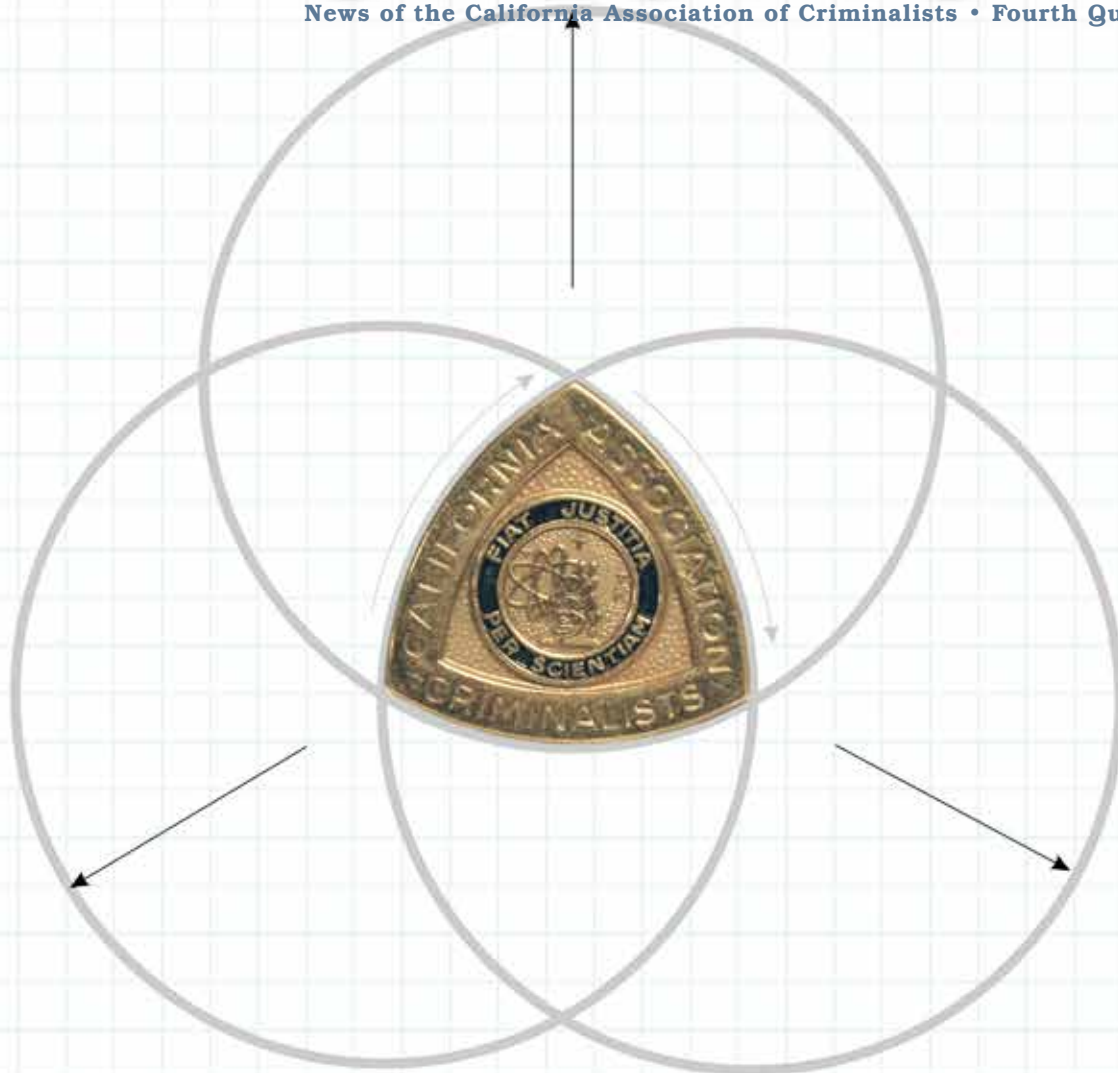
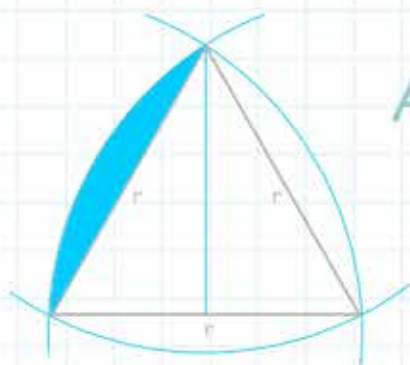


# The CACNews

News of the California Association of Criminalists • Fourth Quarter 2018



$$A_{\text{total}} = A_t + 3A_s = \frac{1}{2} (\pi - \sqrt{3}) r^2$$



$$\begin{aligned} A_{\text{seg}} &= \frac{1}{2} r^2 (\theta - \sin \theta) \\ &= \left( \frac{\pi}{6} - \frac{\sqrt{3}}{4} \right) r^2 \end{aligned}$$

# The President's Desk

## The Year of Our Ear

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**TANN**



*CAC President*

**Your Board of Directors is listening and attempting to implement changes to meet with new norms and to change with the times.**

In my last President's Desk message, I encouraged the membership to speak, share, act and participate. In this President's Desk message, I wanted to update the membership on the Board activities. I realize this can also be gleaned from reading the meeting minutes but I think it'll be more fun and possibly more interesting to hear about in this President's Desk message. Let's hope, right? I will only highlight a few things as I do not want to lose people. This is the year of our ear. Your Board of Directors is listening and attempting to implement changes to meet with new norms and to change with the times.

As we are all well aware, forensic science is far from being static. These new norms that I speak of have to do with stricter ANAB and ABC credit documentation requirements. As such, CAC will begin issuing actual study group certificates (free for members; nominal administrative fee for non-members).

If the budget allows for it, the Board is hoping to use endowment funding to cover study group meeting costs. Thank you, Paul Sham for the suggestion! The A. Reed and Virginia McLaughlin Endowment allows for funding for training, scholarships, and research. Continuing education is essentially training so we are looking to use endowment funds to cover study group meeting costs. I believe this is an excellent way to maximize benefits for the membership.

We will continue to require online registration for study group meetings for logistical purposes and for electronic record keeping of member attendance. The Board has been getting more and more requests for training records for continuing education credit, therefore, this process allows for easier access to these records.

This whole process will be new, therefore, please be patient with your Regional Directors, Cindy Anzalone and Jamie Lajoie as they attempt to work out all the kinks.

I would now like to highlight all the available CAC Awards. Immediate Past President Vince Villena wrote about some of the awards in the 4th quarter 2017 issue of the *CACNews* but I believe it deserves another visit. In my younger years as a criminalist, I, like Vince, had the opportunity to serve on the Awards Committee. I recall my disappointment at receiving very little if any nominations at all when the announcements went out requesting nominations. It looks like the current Awards Committee is facing the same problem. I will not go into details about the awards themselves as the Awards Committee does a wonderful job of publicizing the awards. I will list the awards below and encourage EVERYONE to please, please, please submit your nominations when the email announcement goes out requesting your nominations. Submit your noms TODAY!

ABC Examination Award (July 1-Dec 1)

Edward F. Rhodes Memorial Award (July 1-Dec 31)

Paul Kirk and Presidents Award (Jan 1-June 30)

Anthony Longhetti Distinguished Member Award (Jan 1-June 30)

Roger Greene III Award (Anytime)

W. Jack Cadman Award (Anytime)

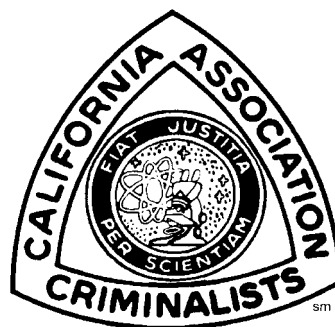
CAC Life Member Award (Anytime)

*mey*

FOURTH QUARTER 2018

# The CACNews

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

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

## The Shape of Our Emblem

[Wikipedia] A Reuleaux triangle is a shape formed from the intersection of three circular disks, each having its center on the boundary of the other two. Its boundary is a curve of constant width, the simplest and best known such curve other than the circle itself. They are named after Franz Reuleaux, a 19th-century German engineer who pioneered the study of machines for translating one type of motion into another, and who used Reuleaux triangles in his designs. However, these shapes were known before his time, for instance by the designers of Gothic church windows, by Leonardo da Vinci, who used it for a map projection, and by Leonhard Euler in his study of constant-width shapes. Other applications of the Reuleaux triangle include giving the shape to guitar picks, pencils, and drill bits for drilling square holes, as well as in graphic design in the shapes of some signs and corporate logos.

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## Forensic Fire

meiling  
**ROBINSON**



*CAC Editorial Secretary*

**Science fiction as well as real life has taught me that there can be a great cost paid for such marvels to exist and dire consequences if they are abused.**

It's almost entirely inescapable at this point. It's everywhere I look and listen; online, on television, in print, in podcasts—this “emerging” technology, “forensic genealogy”, is catching almost as ravenously as actual Californian wildfire. Law enforcement agencies across the nation are all on fire with the prospect of utilizing GEDmatch to solve their cold cases. It certainly is remarkable to witness the impact that genealogy has made (and will continue to make) to forensic DNA as its application continues to be instrumental in solving major crimes. It's interesting to me that this specific utilization of open source genetic databases is only now emerging as most forensic biologists undoubtedly knew that this could be done. I along with more than half of my unit were early adopters of 23andMe®! Like going to the fortuneteller or getting a psychic reading, the health reports were a curiosity taken with a grain of salt, for entertainment purposes only. Most of us found value in researching our own ancestry, and it was interesting discovering distant familial relations among a few of us. We knew then that this public-wide access and commercialization of genetic databasing could have implications for investigative applications in the future. All it took was a hospitable host that could nurture the spark, which ignited this wildfire.

One possible explanation for the slow integration of genealogy to the field is due to the fact that familial relations often muddy the results, effectively reducing the probative value of inclusions with traditional statistical analysis. Additionally, the majority of us work for public agencies and we have little time to devote to anything else outside of casework. We as bench-level practitioners often do little to none of the research that is necessary for us to innovate. As an applied science, forensics is often times at the mercy of developments made and perfected in other individual fields before becoming adopted and woven into our patchwork quilt of forensic science. At times, though, our resourcefulness under these limitations has brought forth many successes. Perhaps this emerging sub discipline of forensic genealogy can be considered our latest triumph?

There are probably a number of other systemic factors to consider which could have delayed the use of genealogical databases as an investigative tool. Specifically, as public crime lab CODIS users it's engrained in us that relatives of suspects are not “putative perpetrators” and that one shall not “go fishing” in the database. It's almost indoctrinated in us that familial searching should be used sparingly; with reservation and only when all other avenues of investigation are fruitless. Even then these searches must be petitioned and sanctioned by the attorney general. Wield the power with caution and regard. As a field we were never really thinking outside the box, operating with one eye closed to the realm of possibilities that didn't have the CODIS database or other suspect-based database at its core. It just didn't seem legally or ethically prudent to search anywhere else but CODIS.

### **The Thin Line**

Due to the increasing demand, this latest development may ultimately prove to be a lucrative field as individuals and companies will undoubtedly seek to monetize it. There will be private companies set up for hire to proffer forensic genealogy services to law enforcement agencies. Without tech review and without proficien-

## Forensics is often considered the science where the ethical lines can get blurred...

cy testing these practitioners will go unbridled for sometime until an agency or entity demands some sort of regulation or oversight. At the same time laboratories encouraged by their sworn counterparts may start to consider providing such services. At first only those agencies with unlimited financial resources and ready access to genetics experts like the FBI may develop “legitimate” programs. As a result, there will be companies and consultants cropping up whose sole purpose will be offering training to bring this expertise to other public crime laboratories and/ or provide accreditation for a hefty fee. This specialty training will help facilitate the creation of this new sub-division in forensic biology/ DNA sections in public crime labs across the nation.

As the desire for more access to public databases by law enforcement increases, more competition will also arise for GEDmatch and the few other companies who currently have research based genetic databases. More databases will emerge focused solely around this investigative application. It will be fueled by the power of raw genetic data willingly offered by citizen scientists and the masses of *ID Channel*— loving public who may want to help “catch criminals.” A truly crowd-sourced crime-fighting enterprise. The potential profitability of this model will be an impetus for biotechnology companies to come onboard with software to help in this type of analysis. They may compete to be first to market with a full service suite from genetic sequencing platform through in-house databasing interface and genealogical analysis software. In what will seem like a blink of an eye, headlines of law enforcement agencies solving their most notorious and seemingly impossible to crack cold cases will be part and parcel of late night news. ‘This just in: the mystery of the Black Dahlia solved!’

This could also change the landscape of public opinion regarding right to privacy over genetic material. This movement of utilizing the power of genetic databases to unlock deep dark secrets coinciding with the zeitgeist of the CRISPR era to come, could catapult us into a genetically enhanced future. Its consequences may polarize us into two philosophical fractions—those who want to live in a *Gattaca* world where we share and use our genetic profiles to “enhance” and even dictate our lives and those who prefer a less genetically altered life in balance with nature. Worse yet this divide could inadvertently create an underclass of humans, discriminated against solely on genetic predictions of poor health and proclivities for vice.

### The Arc Towards Justice

Since the dawn of time, society has used policing as a way of keeping the masses “civilized.” Forensic science is just one tool used to weight the scales of justice as it attempts to enhance and balance policing. I truly believe that science keeps the system honest, lends it a validity and transparency whereby the public can rest in confidence that the justice meted is fair. It’s a balancing act that we as a field must continually stay focused on lest we fail and go off the rails. I believe we have a duty to innovate and do better science, but we also have a responsibility to weigh the ethical and social

ramifications that our science can have. Just as the ethical debate rages on regarding CRISPR, we should at this juncture, while forensic genealogy as an investigative tool is still in its infancy, also be engaging in a similar discourse. I write this not with foreboding but from a stance of cautious skepticism and a healthy knowledge of science fiction. Many of the wildest ideas dreamt up by science fiction whispered kernels of inspiration and sowed the seeds of innovation, which let us reach into the vastness of space and led us to numerous scientific and technological discoveries. Science fiction as well as real life has taught me that there can be a great cost paid for such marvels to exist and dire consequences if they are abused. This is not just kind consideration given to conundrums and lessons learned from cautionary tales in science fiction literature. I can point to very real situations such as that of Henrietta Lacks<sup>1</sup> where discrimination allowed science to justify the devaluing of a person’s health and body for scientific discovery and to the atrocities committed by the Nazis during the Third Reich due to the emergence of eugenics as an ‘applied science’.<sup>2</sup>

I do not dare take for granted the discovery of HeLa cells, the gift that her sacrifice has provided us, nor do I undermine the merit and accomplishments of the scientists who helped even the odds in the fight against cancer. However, I do question the cost and believe that we must have honest discussions about how we practice science when human lives are impacted. We do not desire for our applied science to be the underpinning science used to justify impropriety or discrimination.

We cannot know all the ways personal influence and interest can manipulate science, but we must be vigilant and do our part to guard against it. Forensics is often considered the science where the ethical lines can get blurred, whether it’s to be a “team player” or for personal gain, or simply out of incompetence, I believe that having open ethics conversations is vital to our success and validity as an applied science. It seems like for every headline where forensic science is championed in its use to solve crimes, there’s another article highlighting forensics for its unethical use, improper application, or subjective or “dry-labbed” conclusions given by bad scientists. The foothold of forensics at the turn of the century was when fingerprints and the Bertillon System of Criminal Identification emerged as revolutionary tools used by law enforcement. Today, fingerprint analysis is used all over the world by law enforcement agencies. We all know that Sir Frances Galton invented fingerprinting, but did you also know that he is the very same scientist who coined the term eugenics as ‘the study of agencies under social control that may improve or impair the racial qualities of future generations’, which was the core of the Nazi agenda. We must come to terms with the fact that discrimination based on science occurs and we must heed the lessons from the past for we have a responsibility to engage in these difficult conversations and hopefully, help shape and guide emerging technologies along that arc towards justice.



1 [www.theguardian.com/world/2013/mar/31/henrietta-lacks-cancer-research-genome](http://www.theguardian.com/world/2013/mar/31/henrietta-lacks-cancer-research-genome)

2 [www.ncbi.nlm.nih.gov/pmc/articles/PMC1084095/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1084095/)



## CAC LUGGAGE TAG



Click picture for larger view

CAC logo on one side, "California Association of Criminalists" on the other, and durable white tag on the inside. Who would mess with your luggage when you're sporting this luggage tag??

[MORE INFORMATION](#)

### Manufacturer's Description:

- \* 2.5" X 4.5"
- \* Inside features a Tyvek ID card sewn on inside
- \* Clear plastic loop to attached to your luggage
- \* 100% woven polyester fabric
- \* The outside features white printing on blue background

\$6.00

[IT ADD TO CART](#)

## CAC LOGO CERAMIC MUG



White, ceramic, 12-ounce mug featuring the CAC logo on one side and the famous chalk outline slogan "When Your Day Ends... Ours Begins."

No morning should begin without it!

\$3.00

[IT ADD TO CART](#)

## BEACH TOWEL



CAC Logo Beach Towel, Sized 35" x 60", 100% Cotton, IvoryTouch Screen Print (White) featuring the "California Association of Criminalists" and the famous chalk outline.

These are Navy Blue towels and the lettering design is white.

\$30.00

[IT ADD TO CART](#)

## TRAVEL MUG



A great travel mug with the CAC Logo printed in Kelly Green ink.

### Manufacturer's Description:

- \* 20 oz. double wall, polypropylene
- \* Threaded lid
- \* White gift box included
- \* Dishwasher and microwave safe
- \* Measures 8 1/4"H x 3 3/8"W.

\$6.00

[IT ADD TO CART](#)

## Youth Clothing

### INFANT T-SHIRT (by *Precious Cargo*)



Click picture for larger view

The T-Shirt that started it all... FOR BABIES! Featuring: FRONT: California Association of Criminalists, and BACK: The chalk-outline design and "When Your Day Ends... Ours Begins."

### Manufacturer's Description:

- \* 4.1-ounce
- \* 100% ring spun combed cotton
- \* Large rib neck for easy on-off
- \* Double-needle hem and sleeves for durability

\$8.00

Color:

Size:

[IT ADD TO CART](#)

### YOUTH T-SHIRT (by *Pert & Company*)



Click picture for larger view

The T-Shirt that started it all... FOR KIDS! Featuring: FRONT: California Association of Criminalists, and BACK: The chalk-outline design and "When Your Day Ends... Ours Begins."

### Manufacturer's Description:

- \* 6.1-ounce 100% cotton
- \* Taped shoulder to shoulder
- \* Covered neck
- \* Double-needle hem

\$10.00

Color:

Size:

[IT ADD TO CART](#)

### INFANT ONESIE (by *Precious Cargo*)



A white infant onesie featuring the new famous CAC Store slogan: "When Your Day Ends... Ours Begins."

### Manufacturer's Description:

- \* Overlapping shoulders and a 3-snap bottom closure
- \* 4.1-ounce, 100% ring spun combed cotton
- \* Rib knit lap shoulders, cuffs and leg openings
- \* 3-snap bottom closure

\$8.00

Size:

[IT ADD TO CART](#)

## FEEDBACK

That was a very eloquent article you wrote in the 3rd Quarter, 2018 of the *CACNews*. This is more of a letter of encouragement, I thank you for all you have done. It has been quite a tumultuous time for criminalistics. I highly doubt it is your lack of ability to generate discussion in our field. Many, like me, have coyly admitted that we are introverts not looking to make big waves in a tiny pond. (Everyone seems to know each other!) Could it possibly be the fear of judgment in a land of judges? I wonder sometimes what effect that I, as individual can institute. But as time passes on, it has become more of a burdening obligatory desire to contribute to the goals of the field, rather than to any single party, namely myself. I believe you are right to allude to light. Are we at sunrise or sunset? Either, burgeons questions of where we are consciously, and what our presuppositions are. Is one mutually exclusive of the other, or do we all ultimately desire what is best for justice and the justice system?

In our desire for emphasizing the neutrality of physical science, maybe we have lost our voice and the essence of what

we stand for? Truth in interpretations, reality of the facts, and the unending testing and questioning of hypotheses. These do not come from a neutral position, but as an advocacy for what is, in all its facets and observable signs. I think you are right to wonder if times have changed. I believe they have. You are extremely well spoken and I hope that you do many more things for our field as you transition away from being an editor for the CAC. I hope you can use your gifts to share our professional concerns as criminalists with whomever may hear it. It is important to address the preconceptions during times of arguments. I think Peter DeForest's article *is* pointing to a sunrise. You have done well to do that in this quarter's publication. If we can manage to institute policy changes demanding higher understanding of science and its application from qualified individuals and demand for accountability of interpretations made in the courtroom, maybe we can end the false dichotomy?

Who knows? Discussion breeds change, and change can be good, if we set it off at the right path.

—Erik Haw

## 20 Year-old Editorial Still Relevant Today

I was disappointed in the lack of response to the piece I published in the most recent issue of the *CACNews* (3rdQ 2018). Perhaps I am too sensitive. The questionnaire that I included at the end of the piece generated only two written responses. However, they were thoughtful ones. For a time, following the limited response, I had this recurrent thought of writing a letter to the editor of this publication to express my dismay and solicit a response from the readership that would give me some insight into the attitudes of current CAC members with respect to job satisfaction as well as their knowledge of the early history and philosophy of criminalistics. The idea of writing this letter languished. Other writing projects occupied my attention until I discovered a long forgotten editorial for *Science & Justice* that I had written 20 years ago while I was visiting the Editor, Professor Brian Caddy at Strathclyde University in Glasgow. At that time, the UK government was moving toward privatizing the Forensic Science Service. I strongly felt that this was ill advised, and history seems to have proven me to be correct. I was, and continue to be concerned about the more general problem of the public perception of forensic science falling under a “testing facility” paradigm that ignored the field’s special attributes, including responsibility across the entire physical evidence continuum, from crime scene to courtroom.

I hope this letter will generate response among members of the CAC, despite my earlier article’s failure in this regard. I would like to know how many members have familiarity with some of the foundational philosophies and publications of the field. For example, how many have read some of the writings of Hans Gross, Edmund Locard and those of one of the CAC’s founders, Paul L. Kirk? Do most members read the *CACNews* regularly and take advantage of the valuable resources it and the Association provide? In my opinion, there is no other regional association newsletter that approaches its value and quality. The CAC website allows all of these resources to be easily accessed. For example, do newer or younger members take full advantage of the archives to access past columns such as “Proceedings of Lunch” by Keith Inman and Norah Rudin?

How many CAC members view their employment as a mere job or as a career with special attributes? How many feel seriously constrained by the employment setting? Has implementation of the ostensibly well-intentioned regulations relative to quality assurance resulted in unintended adverse consequences?

I think we need to have a broad conversation on these types of issues in order to be a proactive scientific community taking ownership of the direction which our field is going. Are there any members that would work with me on either having a dedicated session as part of the CAC program at a future meeting, or alternatively a workshop on this subject?

—Peter R. De Forest  
prdeforest@gmail.com

## Knowing What Questions to Ask

[Originally published in *Science & Justice* 1998; 38(1): 1-2]

Three years ago there appeared in the April-June issue of the *Journal of the Forensic Science Society* 1994, an account of some of the presentations at the 34th Annual General Meeting of the Society. The situation prompting the

Scientific questions need to be framed early during the crime scene investigation. Without the right questions being thoughtfully framed, there is little hope of getting all of the relevant answers.

theme “Forensic Science in the Market Place” is somewhat indigenous to the United Kingdom. The presentations dealt with this theme, but a number of equally important more general issues were raised.

In fairness, before getting into the discussion of the more general points, this author’s position on the so-called “agency status” issue should be made explicit. It would seem that this was imposed from “on high” by individuals in government who do not appreciate the nature of the forensic science enterprise. It appears to be misguided, but it may not be proper for an outsider to inject his opinions into the debate on a national issue in another country without being invited to do so. For this reason, and because there is a danger of oversimplification, this editorial focuses instead on those issues that were raised which have applicability to the more general situation. These would apply equally well to the situation with respect to most laboratory systems in the United States. Forensic science is under-appreciated and widely misunderstood around the world.

In his presentation, Dr. William Rodger pointed out that there is nothing inherently wrong with forensic scientists having close ties to the police as long as they remain scientists in outlook and approach. The potential for corrupting pressures on scientists in this role are not trivial. The situation is further complicated in that many of these pressures and influences are subtle and difficult to recognise by inexperienced scientists. These difficulties can and must be overcome, because close ties to the investigation are essential if a forensic scientist is to be maximally effective. The alternative is to have a situation where the forensic scientist is little more than a technician operating in a reactive mode, allowing non-scientists to define and circumscribe the scope of the scientific investigation. If meaningful scientific questions are not framed with respect to possible physical evidence, the potential value of this evidence will not be realised, and little or misleading information will be developed. This same point was made by Dr. Angela Gallop in her presentation. The approach to a forensic investigation must be scientific and holistic. This is only possible where forensic scientists are involved from the outset.

The seemingly simple task of collecting evidence from a crime scene, when properly appreciated, requires a scientific approach and scientific knowledge. In order for evidence to be collected, it must first be recognised. Recognition of evidence is far more demanding than many realise. Some evidence is obvious. Other crucially important evidence may never be recognised unless a scientific approach involving rigorous application of the scientific method is used at the scene early in the investigation. The use of experienced forensic scientists at crime scenes is not the norm in most parts of the world. This underutilisation is not exclusively a problem caused by shortages of resources, although such shortages are nearly universal in this field. The underutilisation is most likely explained by a widespread lack of awareness of the advantages to be gained by having scientists at crime scenes. Certainly

the advent of agency status didn't create this problem. However, unless steps are taken to offset some of the inhibiting aspects of charging for services that aren't fully appreciated, there is a danger that it could exacerbate it.

Historically, many forensic science laboratories in the US were patterned after clinical laboratories because these represented a familiar model. Others were patterned after existing government analytical laboratories. The clinical model was especially common for those laboratories which were set up in medical examiners' offices but was used in others as well. Despite this, a forensic science laboratory is not the same as a clinical chemistry (or other strictly analytical) laboratory. The fundamental difference goes deeper than differences in the nature of the samples and the analytical schemes applied. Rather, it goes to the question of scientific assessment of the problems to be addressed. In the case of the clinical laboratory example the physician makes the assessment and then requests laboratory tests selected from among a finite number of possible tests, each of which has a pre-defined protocol. The samples are of limited variety. Each sample within a given class has been prepared and handled in the same fashion. Little science is necessary once the sample enters the sample stream in the laboratory. The work can be carried out by technicians and automated methods. The results from the laboratory are then sent to the physician who interprets them. The laboratory itself in this case is very unlike a forensic science laboratory. Although, the overall process involved, not the laboratory operation itself, is somewhat analogous to what should happen in a system for the delivery of forensic science services. However, it can be argued that the forensic science situation can be significantly more complex. Thus, there needs to be scientific assessment and sample selection at the beginning of the case and scientific interpretation and integration of the results at the conclusion of the analyses. Serious problems exist especially at the front end.

A related issue needs some attention. Worldwide, there is also a problem in appreciating that forensic science (or criminalistics) is a discipline in its own right. If the assertion that forensic science is not a discipline in its own right, but is instead a loose collection of established disciplines (e.g., physics, chemistry, biology, biochemistry, molecular biology, etc.), is to be accepted, this implies that the work in a forensic science laboratory or service can be neatly partitioned into activities falling within these established disciplines. By analogous reasoning medicine could be carried out by biochemists, anatomists, physiologists, pharmacologists, etc. working together. We would find this ludicrous. Why? Is this because of historical factors or our familiarity with medicine? By what mechanism does a new discipline in science come to be recognised? Is forensic science less distinct from the disciplines which contribute to it than molecular biology is to biochemistry, for example? Most experienced forensic scientists would answer this rhetorical question in the negative. Forensic science uses the scientific knowledge developed in other disciplines, but uses it in different ways to solve the complex and varied problems encountered. The problems and the thought processes necessary to deal with them are distinctly different. No other science is concerned with the process of individualisation, for example. The approach to problem solving is also different.

Scientific questions need to be framed early during the crime scene investigation. Without the right questions being thoughtfully framed, there is little hope of getting all of the relevant answers. Worse, a wrong or misleading answer may

result! It is difficult to understand why so many people, including some forensic scientists, fail to recognise this. Clearly, most people seem to understand that evidence which is destroyed, compromised, or left at the crime scene cannot contribute to the solution of the crime. What seems to be more subtle and not appreciated is that much of the critical physical evidence may not be obvious, and that it is necessary to use the scientific method to select the significant items from among a myriad of unrelated material. Every crime scene is different, and thus, each demands its own unique approach.

In what other scientific arena do non-scientists define anything other than the general problem to be explored? The approaches to the problem solution are left to those best qualified to design them, viz., scientists. Some might counter that non-scientist administrators in funding agencies dictate to research scientists what they are to do. This is only true with respect to the general problem (e.g., find a cure for cancer). Here it is recognised that the research design is left to those best qualified to formulate the scientific questions to be addressed by the research.

In short, the point needs to be made that forensic science and the need for scientific expertise and assessment does not begin at the laboratory door. We need to break with the confining legacy left by the early developmental history of many forensic science laboratories. Although the status quo is not acceptable, a continuing lack of appreciation of the situation and a failure to act may even result in a slow retrograde slide.

—PRD

## Well-Reasoned Opinion Not To Preclude Expert Testimony

As the AFTE Forum moderator for general topics, I came across this ruling by a Colorado judge on a motion to suppress testimony by a firearms examiner regarding the identification of firearms evidence.

The judge laid out an incredibly well-reasoned opinion as to why the firearm's examiner's testimony was to be accepted. While the motion mainly dealt with FATM evidence and testimony, the ruling could apply to other forms of impression and pattern evidence namely fingerprints, footwear and tire impressions, and toolmarks. I am attaching this motion because in my opinion every pattern examiner should read it so that they can perform their casework using sound methodologies, preparing and maintaining adequate case notes, participating in proficiency tests in addition to research studies. Also, the ability to convey in court to a jury, judge, attorneys one's education, training, and experience is key to having these types of evidence and the results and conclusions of the examiner being accepted in court. I hope you see fit to publish the motion all or in part in the next issue of the *CACNews*.

—Greg Laskowski

Excerpt from *People v. Makhail Purpera*, Hon. John W. Madden, IV, District Court, Denver, CO.

### Motion to Preclude Proposed Expert Testimony

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The standard for admitting scientific evidence in Colorado is set forth by *People v. Shreck*, 22 P.3d 68 (Colo. 2001). More specifically, pursuant to *Shreck*, the determination whether to admit such evidence is governed by CRE 702 and 403. Id. at



77. The focus of the inquiry under CRE 702 is whether the evidence is reliable and relevant. *Id.* In making that determination, a court should consider whether the scientific principles are reasonably reliable, and whether the witness testifying about them is qualified to opine on such matters. *Id.* In determining whether the evidence is relevant, a court should consider whether the testimony would be useful to the jury. *Id.*

Ultimately, the methodology used by the People's firearms comparison expert, Charles Reno, is found to be reliable. Mr. Reno discussed not only his own proficiency in matching bullets and cartridges to particular firearms but also a controlled study in which multiple examiners conducted comparisons of hundreds of cartridges with an exceptionally low error rate. Importantly, in that study, almost all the errors were attributable to five particular examiners. Although the defense argues that the level of expertise and experience of those five examiners is unknown, the reasonable conclusion to be drawn from the circumstantial evidence is that those particular examiners were less skilled and less qualified than the examiners who were virtually flawless in their ability to match cartridges to particular firearms. Therefore, the broader conclusion to be drawn from the study is that sufficiently skilled examiners can match fired bullets and spent cartridges with a high degree of accuracy. In turn, this indicates that the methodology, when employed by a sufficiently skilled examiner, is very reliable. Even the 2016 report by the President's Counsel of Advisors on Science and Technology (the "PCAST Report") relied upon by the defense<sup>1</sup> references a study in which there were only two false positive identifications after over 10,000 comparisons. In fact, the most negative study referenced by the PCAST Report involved 22 false positive identifications after almost 2,200 comparisons. Although this is just over a 1% error rate, "reasonably reliable" is not synonymous with "flawless" or "without error."

Since the methodology, when employed by a sufficiently skilled examiner, is reasonably reliable, the next question is whether Mr. Reno is qualified to opine that a particular bullet or cartridge matches to a particular firearm. In this regard, he has almost 20 years of experience and has examined almost 2,000 fired bullets and over 4,000 spent cartridges. Every year during that time he undertook a proficiency examination conducted by an outside firm, and he always passed that examination. Also, his determinations that a bullet or cartridge matches a particular firearm is always verified by a second examiner. He has extensive training going back to the year 2000, he has been certified by the Association of Firearm and Tool Mark Examiners ("AFTE") since 2012, and he has received notable awards from the ATF and the International Association of Chiefs of Police for his work at the Denver Crime Gun Intelligence Center. As such, he is clearly qualified.

Much of the defense opposition to the methodology employed by Mr. Reno results from the fact that, although the underlying basis of firearms examination is founded on objective principles, the determination of a match is subjective. This circumstance, however, is true of a substantial number of expert opinions, such as fingerprint analysis; handwriting analysis; medical and psychological diagnosis;<sup>2</sup> determination of the manner, means, or time of death; blood spatter interpretation; or property valuation. Engineers, scientists, doctors, and diagnosticians often have to interpret data or test results, which necessarily involves a subjective interpretation based upon the individuals skill and experience. Along these lines, CRE 702 permits qualification of an expert based upon

**Much of the defense opposition to the methodology employed by Mr. Reno results from the fact that, although the underlying basis of firearms examination is founded on objective principles, the determination of a match is subjective.**

experience, not just education or training. The fact that a firearms examiner's criteria, and therefore his accuracy, will improve as he compares more and more bullets and cartridges is wholly consistent with the concept that experts can opine based upon their knowledge acquired through experience.

The defense also contrasts ballistics comparison with DNA evidence, however, the nature of STR DNA analysis is fundamentally different, and it involves statistical assertions that are simply not found, if even possible, in any other areas in forensic science. If opinion testimony had to include this same type of objectively verifiable percentage for every opinion, almost no other expert conclusions outside the field of DNA analysis would be admissible.

The defense argues that Mr. Reno should be required to phrase his conclusion in such a way as to include the AFTE criteria for a match. This is an issue that is better handled by cross examination. In fact, as noted in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 596 (1993), if the Defendant believes there are weaknesses in the foundations of the evidence, vigorous cross examination, presentation of contrary evidence, and careful instruction on the burden of proof are appropriate means of attacking it. In this regard, the cross examination of Mr. Reno at the motions hearing<sup>3</sup> effectively and clearly demonstrated the Defendant's concerns in ways that would easily be understood by the jurors in this case.

With regard to the PCAST Report relied upon by the defense, part of the purpose of an evidentiary hearing is to present information on a contested issue so that it may be explored and potentially challenged. The PCAST Report is hearsay not subject to an exception, including CRE 803(18). While its attachment to the Motion to Preclude established that there was a factual issue to be resolved at a hearing, attaching an exhibit to a motion does not make it the equivalent of an admitted exhibit or otherwise circumvent rules of evidence. Although some of the information in the report is used in the analysis above, that is because the information was discussed by Mr. Reno at the hearing without objection. In addition to the fact that the report is hearsay, it is a report to the federal executive branch, not to the judicial branch, and it was written with the stated purpose of trying to find things that could be improved in the forensic sciences. Goal driven efforts to find things to criticize tend to present an unbalanced picture and tend to disregard, sometimes inadvertently, contrary evidence.<sup>4</sup> In this regard, Mr. Reno was critical of many of the report's conclusions regarding firearms analysis and noted that none of the authors of the report had experience in that field. With regard to the Gianelli article, *Ballistics Evidence Under Fire*, attached to the motion, it is also hearsay. Further, it was not discussed by Mr. Reno at the hearing, and it presents, at best, inadmissible legal opinions.

The Defendant also cites to a number of federal cases. First, it is of note that most of the cases cited by the defense regarding firearms analysis are opinions by federal trial courts.<sup>5</sup> Even opinions by federal circuit courts of appeal are not binding on this Court and are only potentially persuasive authority. Further, the cases are the same as those discussed in the Gianelli article.

That article, revealingly entitled *Ballistics Evidence Under Fire*, has a clear, one-sided aim of showing that some courts have recently become more critical of firearms evidence and it presents only cases supporting that premise.<sup>6</sup> Nevertheless, of the cases cited by the Defendant, portions of *United States v. Monteiro*, 407 F. Supp. 2d 351 (D. Mass. 2006) are persuasive. In *Monteiro*, the federal trial judge held a six day hearing on the issue and found that the underlying scientific principles of firearm identification are valid. *Id.* at 355. That judge went on to decide that, because of the subjective nature of the determination whether a spent cartridge matches to a particular gun, a firearms examiner has to be qualified through training, experience, or proficiency testing to provide expert testimony. *Id.* These conclusions are consistent with the information presented in the present case, and Mr. Reno has demonstrated more than sufficient qualifications arising from training, experience, and proficiency training. The judge in *Monteiro*, however, ultimately precluded the testimony in that case, not due to any concerns with the reliability of the methodology of firearms analysis, but because the expert did not document his reasons for concluding there was a match and did not subject his determination to review by another trained examiner in the laboratory. In the present case, Mr. Reno did have a second, certified examiner review the bullets and cartridges who also determined they matched. It is the Court's recollection that Mr. Reno indicated that he took photographs, although that testimony may have instead related to the ability to take photographs. In any event, however, the testimony at the hearing in this case made clear that even photographs do not fully capture the detail that can be perceived by the examiner's eye. Although it may be AFTE practice (the Court does not recall that such evidence was presented at the hearing), documentation in the form of photographs, sketches, or notes, does not impact whether the methodology is reasonably reliable or whether the examiner is sufficiently qualified to make a reliable comparison. Moreover, the bullets, spent cartridges, and the firearm were all retained and subject to examination and retesting if necessary. As such, the Court disagrees with the decision of the judge in *Monteiro* that an examiner must necessarily keep photographs, sketches, or notes in order for his identification to be admissible.

Lastly, with regard to CRE 403, the probative value of the evidence is overwhelming. If believed by the jury, the evidence establishes that the handgun recovered in the possession of the Defendant was the one used to shoot the victim in this case, which is a central issue in this case. The reliability of the methodology used to match bullets and casings with particular firearms substantially reduces the risk of unfair prejudice. More importantly, the principles upon which firearms identification is founded and the fact that the determination involves a subjective analysis based upon the experience of the examiner are easily understandable and can be effectively presented through direct and cross examination such that there is little risk of the jury uncritically adopting Mr. Reno's opinions without due consideration of these issues. Accordingly, any risk of unfair prejudice or confusion of the issues does not outweigh the probative value of the evidence.

For the above reasons, the Motion to Preclude is denied.

\*\*\*

## Notes

1 For the reasons discussed below, to the extent the PCAST report is considered, it is given limited weight in certain areas.

2 In this regard, the Court disagrees with the suggestion that medical and psychological diagnoses are based upon strictly objective criteria with no application of the judgment and experience of the doctor or psychologist. If this were the case, all doctors and psychologists should reach the same diagnosis for a given patient. See also *United States v. Glynn*, 578 F.Supp.2d 567, 573 (S.D.N.Y. 2008) (exercising a considerable degree of subjective judgment is true of many kinds of accepted expertise)—a case cited and relied upon by the Defendant.

3 Some of the cross examination at the hearing related to the PCAST Report. Mr. Reno did not take the position that the PCAST was a reliable authority on firearms identification, and it does not appear to fall under CRE 803(18). The report may fall under the provisions of CRE 703, but that seems unlikely based on the hearing testimony.

Accordingly, some of the specific cross examination questions used at the hearing may not be available at trial. This fact notwithstanding, Mr. Reno acknowledged much of the same information, such as study results, presented by the PCAST Report. An expert witness can certainly testify to his own knowledge of the field in which he has expertise. In other words, even if the PCAST Report itself and the opinions of its authors may not be admissible, Mr. Reno can likely testify to the underlying information.

4 In other words, people often find what they are looking for because they want to find it.

5 The one appellate decision, *United States v. Williams*, 506 F.3d 151 (2d Cir. 2007), actually upheld that the firearms evidence at issue was reliable and admissible. Although the opinion does state that the Second Circuit was not taking the position that “any proffered ballistic expert should be routinely admitted,” *id.* at 161, there is nothing in the opinion expressing concern regarding the methodology of firearms identification.

6 Most of the opinions, with the exception of *Williams* have been either rejected, limited, or distinguished by other federal and state opinions.



Analytical Chemists in the Wild West

## CAC Fall Seminar

### Workshop Descriptions

Visit [www.cacnews.org](http://www.cacnews.org) to get registered and see the latest seminar information.

#### Chemistry Workshop- Chemical Isolation Techniques and Sample Preparation on Difficult Samples

Monday, October 29, 2018 (full day-includes lunch)  
\$120 (members)/\$140 (Non-members)

This full day workshop will cover chemical isolation and sample preparation on drug samples including difficult samples. With all of the counterfeit pills and synthetic drugs being impounded in laboratories today, it can be challenging to test these samples and find the standards necessary to identify these designer drugs. Tim will take attendees through better ways of preparing samples, including simple methods for pill preparation before taking the sample to an instrument. Attendees will head back to their laboratories with new methods for getting their samples ready for analysis. There will be a question and answer session at the end of the day. Please bring any challenging cases you would like to share with the class, questions about difficult samples you have encountered, or instrumentation questions.



#### DNA Workshop

Monday, October 29, 2018 (full day-includes lunch) \$150 (members)/\$175 (non-members)

The DNA Workshop will discuss the latest developing topics in the forensic community. These may include the estimation of physical characteristics and ethnic origin from biological samples, the use of genealogy to aid in the identification of perpetrators, STRmix analysis of DNA mixture data, courtroom experiences presenting STRmix data, unique approaches to analyzing sex crime backlogs, case presentations that demonstrate unique insights, and other topics of interest. The DNA Workshop will draw speakers from a variety of government and private laboratories.



#### Leadership Workshop- Powerful Tools and Insights for Developing Future and Current

##### Forensic Science Leaders

Tuesday, October 30, 2018 (1/2 day afternoon-no lunch) \$110 (members)/\$130 (Non-members)

This workshop will provide powerful tools and insights targeted to help Forensic Science professionals become more effective leaders, by focusing on strategies to improve communication and interpersonal skills. Problem-solving and decision-making are essential elements in daily leadership, and are often made quickly and under stressful conditions. As leaders, we tend to reach for solutions that have proven to work in the past, assuming that these will be effective solutions moving forward. In this class, attendees will investigate alternate approaches to enhance their abilities to think "outside the box," incorporate global perspectives, and understand their personal leadership style. Lessons learned in this workshop can be practically implemented in the workplace at any level, and will benefit those wanting to enhance their leadership acumen.



#### ANAB Workshop – Forensic Accreditation Requirements in a Nutshell—How to Crack that Nut!

Tuesday, October 30, 2018 (full day-includes lunch)  
\$160 (Members)/\$180 (Non-members)

The 2017 Version of ISO/IEC 17025 and the Related ANAB Forensic Accreditation Requirements in a Nutshell

Both ISO/IEC 17025:2017 and the related ANAB Forensic Accreditation Requirements documents have been updated and have moved to less prescriptive requirements. Mentioned in the Foreword to ISO/IEC 17025, this move is supported by an application of risk-based thinking and a focus on performance-based requirements (a move from "how" to "what").

This workshop will review the main sections of ISO/IEC 17025:2017 and for each section, discuss the overarching concept and then focus on the intent of the requirements from both documents. For those requirements that are more open-ended, examples and/or exercises will explore options for conformance. Keep in mind that the approach to conformance will most likely not be the same for all forensic service providers! The relationship of Process-Risk-Continuous Improvement will be explored.

Workshop participants will leave with a path forward to accreditation based on these updated accreditation requirements and a new perspective towards this revised approach to accreditation. The glass is half-full – the upside to risk-based thinking is opportunity!

# Facets of Forensic Science

Spring 2019 CAC Seminar

May 13-17, 2019

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



# California Association of Criminalists

## CALL FOR PROPOSALS

### 2019-20 McLaughlin Endowment Funding

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

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

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

### *Specific Requirements for Proposals*

#### I. Training

##### A. General

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

##### B. Request Format

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

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

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

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

#### II. Scholarships

##### A. General

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

##### B. Request Format

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

1. CAC Seminar Technical Program

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

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

##### C. Reporting of Distributions

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

##### D. Refund of Unused Endowment Funds

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



### III. Technical Development and Research

#### A. General

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

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

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

#### B. Request Format

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

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

#### C. Progress Reports

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

3. CAC Seminar Technical Program

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

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

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

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

Send proposals to:

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

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

Send proposals to:

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

#### PLEASE NOTE:

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

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

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

**CALIFORNIA ASSOCIATION OF CRIMINALISTS  
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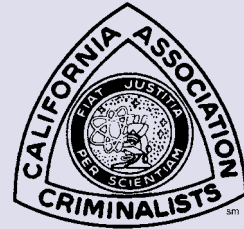


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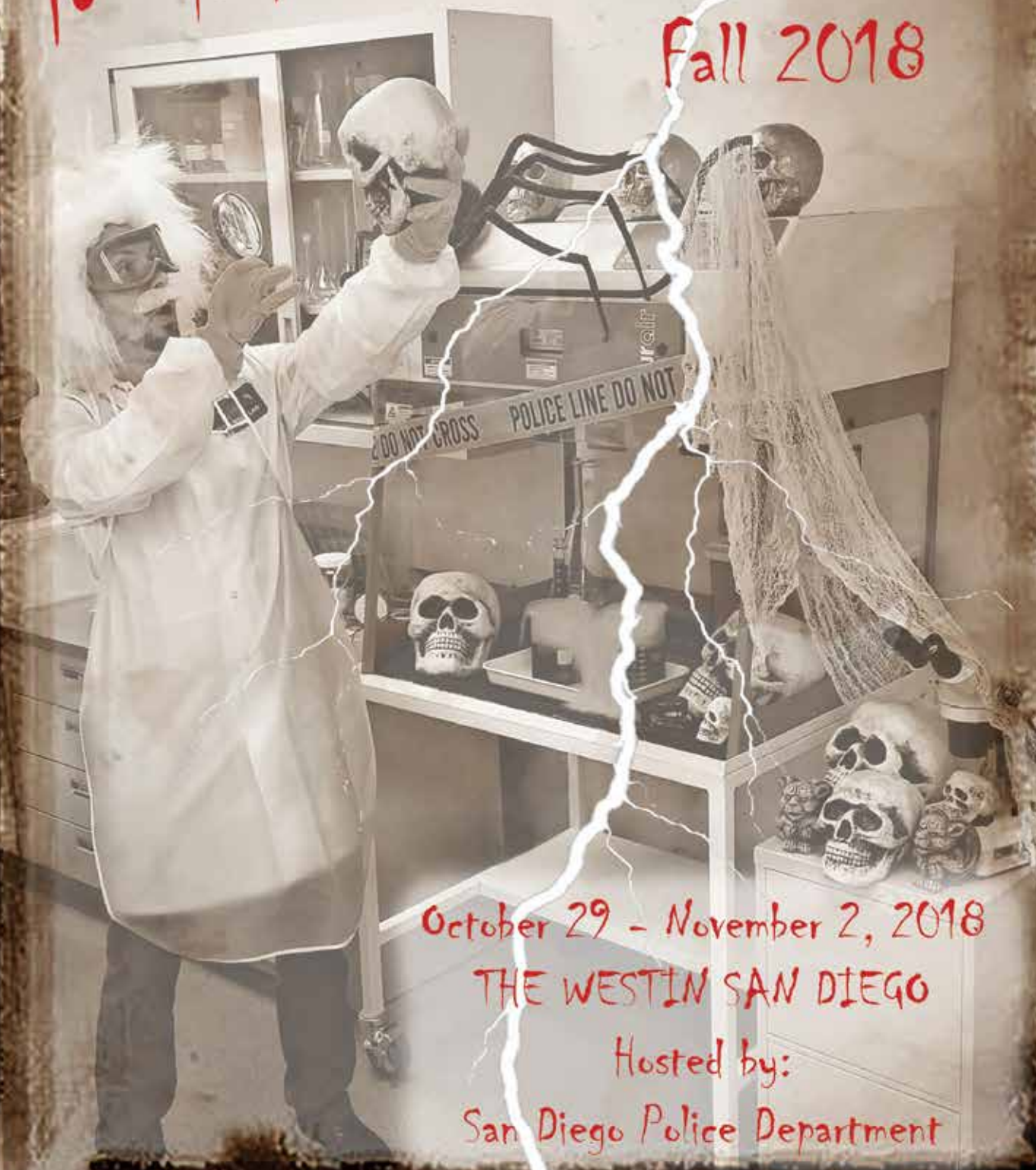
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