

News of the California Association of Criminalists • First Quarter 2003



# AFQAM: Concerns and Influence

I am writing this column while wearing two hats this time. Ray Davis suggested I do a column on influence and while I felt that was intriguing, I also could not pass up the opportunity to talk about a very significant step in the development of the AFQAM organization. Solution: write about both. This column, therefore, serves as both the editorial as well as the QA column.

### What is AFQAM?

For those of you who are wondering what AFQAM is, it is the first national association of forensic quality assurance managers in the country. It started with our southern regional quality assurance manager group connecting beyond the CAC meetings by an email list. A few words were dropped in some key places, and interest spread across the country to join up on email. Through 2000-2001, we planned and talked about where we wanted to go with this new collective effort.

We used the email list every day to consult on QA issues. In 2001, our planning resulted in a group of 22 QA managers meeting in Kansas City for two days and forming the roots of AFQAM. We set up bylaws, elected officers, and shortly afterwards, we incorporated.

Our next step was holding a national meeting in Austin, Texas, back in October. At that meeting, we had over 50 participants and now have almost 70 paid members focused on forensic quality assurance. The week-long meeting included workshops by NFSTC on ISO standards, followed by two days of presentations from quality assurance managers from all over the country.

#### **AFQAM Taking Action**

At the close of the meeting, we shifted from planning into action. In 2003, we will be starting a national newsletter for the membership. We hope to exert influence into the quality assurance environment, including the accreditation process. We already have established influence with our daily, national contact and exchange of information. Instant, national feedback has had direct, unofficial influence during the inspection process. The daily exchange has influence on how we do things in our own laboratories. My boss, for instance, sometimes likes to get the national feedback to find out what the industry standard is on a particular issue. AFQAM has, consequently, approached ASCLD-LAB to see if we can start a dialogue on establishing formal influence.

AFQAM thinks this is important since ASCLD-LAB inspections are based on published criteria that have to be interpreted by inspectors, laboratory directors, and quality assurance managers. No inspector knows everything. No QA manager knows everything. We have all heard the stories from ASCLD-LAB inspections of unreasonable interpretations being imposed. ASCLD-LAB has restructured itself, and the process, to help reduce these occurrences.

AFQAM is extending its hand in a gesture to form a partnership with ASCLD-LAB to provide additional input and help especially at critical moments. This could be done either during an inspection or afterwards.

#### Lab Director Concerns

At the outset, we started to feel the ripple affects when we were just a southern regional network. I gave a presentation on the Southern QA group network to CACLD and was met with some trepidation. I was asked why we, as quality assurance managers, felt we had to form this group? My answer was because we as quality assurance managers were the ones who had to implement and monitor policy created by laboratory management. We had to face the attitudes of those who think we sometimes have our heads anatomically relocated. We could provide mutual support. We could provide alternative possibilities when some of us faced uncertainty. The question to me, I felt, was how could we NOT form this group?

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WE HAD TO FACE



John Simms CAC Editorial Secretary

Please turn to page 5



# First Quarter 2003



On the cover...

Workshop participants Laurie Crutchfield and Don Petka examine evidence recovered from a fire of suspicious origin. More photographs from the 100th semiannual seminar inside.

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# CACBits • Section News

CAC Members in *Time* 

CAC members were

quoted in *Time* magazine's

October 21, 2002 issue. Su-

san Narveson, Barry

Fisher, Lynne Herold, Fred

Tulleners and Faye

Springer were inter-

viewed. The article, titled

"How Science Solves

Crimes," was written by

Jeffrey Kluger and features

opinions from various

criminalists about the im-

pact of television on the

public's perception of fo-

rensic science.

No fewer than five



# Southern California Section

## Study Group Meeting

A tentative date of January 22, 2003 has been selected for LASD to host a study group meeting at the Los Verdes Country Club. The topic will be "underwater and mountain evidence/body recovery." The contact person for this meeting is Jasmine Murphy, jrmurphy@lasd.org. Please visit www.cacnews.org for the latest information.

## **Cal State LA Job Opening**

This is an except from the flyer, Please visit the CAC website or contact CSULA for further information

A Tenure-Track Faculty in Criminalistics, open rank with possibility of tenure is announced in Criminal Justice and

Criminalistics with a starting date of Fall 2003. Minimum qualifications include a master's degree in a natural or a forensic science from an accredited institution is required by the time of appointment; doctorate preferred. Preference will be given to candidates with criminalistics or forensic experience, the potential for research and scholarly activity, a record of publications, demonstrated potential for effective teaching using a variety of methodologies, experience in obtaining external funding, and broad experience within the criminal justice community. The candidate must demonstrate proficiency in oral and written communication and have an interest in working in a multiethnic, multicultural environment.

Faculty will teach undergraduate and graduate courses across the discipline of criminalistics. Further, faculty are expected to be involved in scholarly activity, participate in university and community service, develop grant proposals, and provide student advisement.

California State University, Los Angeles, a comprehensive urban university and one of 23 campuses that comprise the California State University system, offers programs in more than 50 academic and professional fields. The campus is located at the eastern edge of Los Angeles and adjacent to the western San Gabriel Valley, with more than 22,000 full and parttime students reflecting the rich, ethnic diversity of the area. The University is committed to student-centered learning, free scholarly inquiry and academic excellence, hires on the basis of merit, and encourages qualified minorities, women and persons with disabilities to apply.

Initial salary commensurate with qualifications and experience.

Please send a cover letter and vita outlin ng teaching, research and grant experiences, three letters of recommendation and an official transcript from institution

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Just in: CAC 14 oz. stainless steel mugs (\$10), CAC Acrylsteel Mugs in Candied Apple Red and Sapphire Blue. (\$12), CAC 8 oz. wine glasses (\$5). Please note: Polo shirts and denim shirts will be available if ordered PRIOR to the seminar. We also have a new shipment of navy blue T-shirts "When your day ends. . . Ours begins" with chalk outline.

# Jobs • Meetings • Courses

awarding highest degree. Employment is contingent upon proof of eligibility to work in the United States and completion of the University's Application for Academic Employment form.

Review of completed applications will begin January 6, 2003 and continue until position is filled. Position will be converted to a one-year full-time temporary position if not filled. Applications, required documentation, and/or requests for information should be addressed to:

Dr. Deborah Baskin, Chairperson Department of Criminal Justice and Criminalistics California State University, Los Angeles 5151 State University Drive Los Angeles, CA 90032-8163 (323) 343-4610 For more information, access our Web site: <u>http://www.calstatela.edu/academic/hhs/</u>

## **McCrone Research Institute Courses**

Submitted by the Staff of the McCrone Research Institute

The McCrone Research Institute would like to inform you of several microscopy/trace evidence training courses that are being offered in 2003, including a three-day course in Chicago prior to the AAFS annual meeting. We hope to see you in Chicago for a training course soon.

Alicia Jimenez Registrar McCrone Research Institute (312)842-7100, -1078(fax) ajimenez@mcri.org www.mcri.org

Please email the membership secretary at <u>elissa.mayo@doj.ca.gov</u> if you would like a copy of the flyer.

## U P C O M I N G

M E E T I N G S

Spring 2003—David Atkinson, Washoe County Sheriff

Fall 2003—San Diego Sheriff

Spring 2004—San Mateo Sheriff

Fall 2004—Ventura Co Sheriff

Spring 2005—Oakland PD

Fall 2005—DOJ Riverside

## Can't Find It?

To reduce the costs of publication, the *CACNews* may place calls for nominations and other items that were previously found in the newsletter mailing as inserts ON THE WEB. Visit www.cacnews.org to see what is offered. Content changes periodically, so visit often!

# AFQAM, cont'd from page 2

The same concerns were encountered with a new presentation to CACLD on the Austin meeting. The same question was being asked: Why? What was the need? The concerns seemed to center on QA managers subverting the authority of the laboratory director. But good quality assurance managers should explore all resources available to them, just as a good laboratory director should explore all resources. Through the national QA network, we can collect information rapidly, thoroughly, and efficiently. This helps to provide a better basis for the laboratory directors' decision making. Are the laboratory directors nationally networked? While ASCLD-LAB has a physical list of emails, they are not linked on the internet as the emails for the quality managers are.

## **ASCLD-LAB Concerns**

AFQAM is also facing concerns from ASLCLD-LAB, which I think is somewhat ironic. ASCLD-LAB works directly with the quality assurance managers before, during, and after the inspections. They claim to have great respect for the quality assurance managers they have contact with. But building a bridge of influence between AFQAM and the ASCLD-LAB inspection process will be an uphill battle.

ASCLD-LAB wants to protect the inspection process and keep it closed while it is in progress. It may absolutely be the right thing to do in keeping the AFQAM voice out of the inspection process as it occurs. Rightly or wrongly, history shows that that is exactly where AFQAM has had the impact.

It also seems ironic that some quality assurance managers have been directed to stay off the QA network during their ASCLD-LAB inspection. This seems a bit harsh to me. And I ask why would you close the door to a resource if interpretation questions arise on a particular issue?

## Let's Really Find Out

I do not believe that ASCLD-LAB has ever done a customer service survey to find out if the restructuring (which I was involved in) has improved the perceptions of those involved in the process. Have they improved a lot? A little? Not at all? Do we still have some of the same complaints of unreasonable interpretations of ASCLD-LAB criteria? Has the number of these complaints decreased? ASCLD-LAB may not want to put out a survey through their network. AFQAM could certainly do this very easily.

## **Providing A Service**

AFQAM wants to be service to everyone. We want to provide help no matter who needs it. As I stated earlier, the ASCLD-LAB inspectors do not know everything. The QA managers do not know everything. That is the point: we are here to provide advisory assistance no matter who needs it. We are not threats to the authority of the laboratory directors. We are not adversaries in the ASCLD-LAB inspection process. Our job is to measure, monitor, and assure compliance with accreditation standards, and to help improve the practice of forensic science. AFQAM's mission is to build that advisory role in whatever positive, constructive way we can. That is the charge that I have been given as president of AFQAM.

# FEEDBACK

The CACNews prints letters to the editor that are of interest to its readers. We reserve the right to edit letters for brevity and clarity. All submissions to this page become the property of the CACNews.

## As Good As We Could Be?

I would like to echo the sentiments expressed by Bob Blackledge, John Houde, and Jim White in recent issues of the *CACNews*. Their concerns are nicely illustrated by a comparison of the program for the 100<sup>th</sup> CAC Seminar in October of this year with the 50<sup>th</sup> Seminar in October of 1977.

To set the 1977 stage: Genetic analysis of biological evidence using multiple enzyme and protein systems was just on the horizon. Daubert was a name no one had ever heard of and Kelly-Frye was a mystery to the vast majority of criminalists. The lull in the exploration of space between moon walks and the space shuttle had propelled the Aerospace Corporation into the forensic science arena and the CAC. It was not unusual for CAC presidents to name each attendee at a business meeting or dinner meeting. There were no criminalists working in Berkeley except in the active graduate program at the University of California.

The CAC Seminar in October, 1977, was held in San Jose. The program abstracts (conveniently distributed to all CAC members for inclusion in the binder that was presented to each new CAC member and which contained abstracts from all previous seminars back to 1954) showed 12 papers in all, 11 with technical content (the 12<sup>th</sup> was about plans for proficiency testing of blood alcohol laboratories by the Department of Health). Eight of these papers were authored by CAC members. It is worth noting that at the May, 1977 seminar, there were 21 papers presented, essentially all with technical content and the majority by CAC members. At the May, 1978 seminar, there were 29 papers presented, again almost all with technical content and by CAC members.

We leap forward a quarter century: DNA is consuming forensic science; Daubert is a name as familiar, maybe more, as Paul L. Kirk; Legal and scientific disputes are raging over everything from microcrystal testing of drugs to the validity of fingerprint identification to the methods used to reach conclusions in bullet comparisons. The CAC membership is approaching 700 more than doubling in the past 25 years. Far from being concerned primarily with forensic science in California, the CAC is involved with forensic science in a national and international way: the ABC, multiple SWGs, ASCLD and ASCLD-LAB all have CAC representatives. The CAC is so flush with money that the Board of Directors has underwritten the 100<sup>th</sup> Seminar with money to purchase fancy briefcases for the attendees, reduced registration costs to \$50 for those with the foresight to apply for early registration, and has been directed by vote of the membership to devise a plan to provide funding to assist members who would like to go to the joint meeting of the Forensic Science Society and the CAC in England next March.

How is the current state of affairs reflected in the 100<sup>th</sup> Seminar? There are a total of 17 presentations, less than half(7) by CAC members. Five of the 17 presentations appear to have no specific technical content. Of the 12 presentations with some technical content, only half were presented by CAC members. Of the total of 68 laboratories represented among the CAC membership (16 private laboratories and 51 government laboratories), 10 were represented on the program. Absent from this list are many of the larger laboratories and laboratory systems in California. Of that portion of the meeting dealing with technical investigations(approximately 6 hours of the two and a half, plus, day meeting), 2/3 of the time was devoted to investigations by forensic scientists and 1/3 of the time to investigations conducted by dogs.

There was not a single presentation dealing with any of the current controversies in forensic science. In spite of the millions of dollars being spent for DNA programs, there is not a single presentation on the agenda dealing with DNA. (To be fair, DNA analysts have their own meeting in order to avoid, apparently, any intellectual cross-contamination.) In spite of legal challenges and technical disputes in the field of fingerprint identification, firearms identification, and questioned documents there is not a single presentation dealing with any of these issues. In spite of mandates specifying how our jobs are to be done being promulgated by ASCLD-LAB, SWGDAM, SWGMAT, and a host of other SWGs and TWGs, there was not a single presentation (with the notable exception of the presentation by Jerry Massetti and Gary Chasteen about SWGDrug) on any of these topics. This is in spite of the frequent representation from these various SWGs that the mechanism for dissemination and discussion among those not invited by the FBI to be SWG members is at the regional professional association meetings.

The CAC has an endowment of roughly a million dollars. The CAC has an annual operating budget of roughly \$75,000 and spends that money, plus income from the endowment investments (drastically reduced from previous years) to support a variety of projects. The annual business meeting in which CAC investment policy can be debated, and decisions about what programs to support and how much to support them, was held before breakfast. The agenda was not available before the meeting, and even the names of new members, which are supposed to be provided to all members 30 days prior to the meeting, were not available before the meeting.

As we progress into the 21st Century, we need to ask ourselves about our role as criminalists and the role of our professional associations. If we do not want to have any influence on how forensic science is used in the future, we can sit at our lab benches responding to requests from investigators and attornevs for analyses, occasionally attend a meeting where we are told how to do more analyses with older samples and generate smaller numbers, and hope that some clever lawyer or scientifically ignorant court will not negate our work. On the other hand, if we believe that forensic science has a role to play, and that forensic scientists should have a part in determining that role, we need to develop the skills to conduct a scientific investigation, present the results of our investigations for review by our peers, and develop the professional stature to make sure policy makers look to forensic scientists when making decisions about forensic science. Our professional associations are the primary forum for establishing the intellectual and technical basis of our science, demonstrating our ability as scientists to contribute to the justice system, and developing a strong professional identity which will allow us to exercise our professional will and political power.

It is regrettable that CAC Members and the organization did not take advantage of the occasion of the 100<sup>th</sup> Seminar to demonstrate a renewed and continuing commitment to the continuation of the CAC's historically strong role in the technical and professional development of criminalistics.

# norah rudin & keith inman • the proceedings of lunch

# Articulating Hypotheses— The Null Hypothesis and Beyond



If forensic science is to be accepted as a legitimate science, it must follow the same framework of hypothesis testing expected as any rigorous scientific pursuit. Classically, this was defined by Karl Popper (1962) as the ability to articulate a hypothesis that could be tested. In very simple terms, the scientist proposes a hypothesis, performs experiments to test the hypothesis, and obtains results that either tend to confirm or invalidate the hypothesis. To classify an endeavor as science, one must be able not only to state a hypothesis, but to imagine a way to test it.

We reflect on this because of a chance encounter while "surfin' the 'net." One of us came upon a student term paper posted by a faculty member at the University of San Francisco. (Do, 1998) In it, the author discusses the statistical basis for calculating population frequencies of a DNA profile, and states:

The proper null hypothesis  $(H_o)$  is to assume that a match is due to random chance and a probability value is calculated to quantify the uncertainty of this assumption. It has been noted that one reference text did set the null hypothesis to determine whether a person "is the source of an item of biological evidence," which would be the equivalent of looking for proof of guilt.

While most readers of the *CACNews* will immediately recognize the obvious fallacy in categorically equating a DNA match with guilt, it is our experience that many analysts also believe the appropriate hypothesis to be that the evidence and reference samples have different sources. We provide some basic background on the scientific method and hypothesis testing, and assert that the only useful null hypothesis in a forensic context is that the evidence and reference samples share a common source.

The *scientific method* provides a framework for hypothesis testing. In reality, we can never prove that an idea, concept, or theory is true—we can only fail to prove that it is false. In the absence of information that a theory is untrue or incorrect, we accept it as correct until new information is obtained that demonstrates otherwise. Both in science and forensic science, we frequently have an idea in mind—this bullet came from that gun—before any testing commences. This is called the *null hypothesis*. (Fisher, 1949) Much confusion and misunderstanding exists around the idea of the null hypothesis. Contrary to popular misconception, the null hypothesis is not necessarily a negative statement. In fact, whether the hypothesis is expressed as a negative statement (these are not the same) or a positive statement (these are the same) is an irrelevant criterion. The most useful working definition of the null hypothesis is that it must be falsifiable. (Stark, 2000)

The scientific method is often exemplified by the process of clinical drug testing. Is a particular new drug more effective than a placebo for treating the symptom or disease? In this case, the null hypothesis is, the drug and the placebo will have the same effect. Only by disproving this hypothesis<sup>1</sup> (usually by showing a statistically significant difference in the outcome) do we accept the efficacy of the new drug treatment. An analogous procedure exists in forensic science. It is most clearly demonstrated using comparison evidence. Take, for example, bullet comparison. The scientific question typically asked is, were these two bullets fired through the same gun? The bullets of interest could be either a reference bullet and an evidence bullet, or two evidence bullets. The two most obvious hypotheses can be stated as:

#### These bullets were fired through the same gun. or These bullets were fired through different guns.

It is critical to emphasize that, in translating the scientific question to an hypothesis, it becomes a statement. This feels scary to neophyte (and even to some more experienced) criminalists because, to the uninitiated, making a statement before examining the evidence is sometimes misinterpreted as bias. Additionally, in hypothesis testing, the null is assumed to be true until proven otherwise. This strengthens our misunderstanding that bias is at work. A discussion of bias itself is best left to a future column; however suffice it to say that articulating hypotheses and assumptions (another topic for future discussion) supports rather than hinders an objective analysis.

Returning to our two hypotheses, which is the null hypothesis? Many people instinctively choose the statement, *"These bullets were fired through different guns"* for two reasons. One, they equate the word "not" with "null." Two, they assume that making an initial statement that would appear to exclude the gun as the weapon used in commission of the crime is *a priori* "conservative in favor of the defendant." Yet more fodder for a future column, but in their zeal to avoid bias, or at least the appearance thereof, they defeat their own purpose. Regardless, the negative statement cannot be the null hypothesis for a more fundamental reason—it cannot be falsified.

Let's look at this a bit more closely. What do we need to

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do to disprove the hypothesis that the bullets were fired through different guns? We could start with gross rifling characteristics. However, this violates one of the requirements of hypothesis testing-that the test is sufficiently discriminating to detect relevant differences. We proceed to examine microstriae. We find twenty consecutive striae that match. Have we disproved the hypothesis? What if the next one we look at shows a legitimate difference? How many more do we need to examine before we categorically disprove (different than becoming convinced) that the bullets are different? Even if we could look at all the microstriae and no unexplainable differences are found, the possibility still exists that the similarity is due to a random match. No way exists to definitively disprove the negative hypothesis. Failing to disprove the hypothesis cannot definitively demonstrate that the bullets passed through the same gun. Before the reader's brain becomes hopelessly contorted, let's show how simple it is to disprove the null hypothesis when the correct one is chosen. If the hypothesis is taken as "These bullets were fired through the same gun.", a single unexplainable difference indisputably refutes the hypothesis and we must reject it. For source determination in forensic science, the only useful

# ...to the uninitiated, making a statement before examining the evidence is sometimes misinterpreted as bias.

null hypothesis is, "*The evidence and reference are from the same source.*" While the tendency is to choose an initial hypothesis that is apparently exculpatory, it is essentially meaningless because it cannot be falsified.

When the null hypothesis is disproved by experimentation, we must accept one or more alternative hypotheses. While we cannot scientifically prove our hypothesis, we can try very hard to disprove it. If we perform discriminating and adequate testing, and repeatedly fail to disprove the null hypothesis, we may become convinced that our original hypothesis is true – that the bullet did pass through the gun. With sufficient data, we can quantify our conviction. If the testing does, in fact, disprove the null hypothesis, we must accept the alternate hypothesis (Neyman and Pearson, 1928) – that the bullet was not fired from the gun. Although these ideas are basic tools of the working criminalist, they are rarely recognized or articulated.

Let's take a look at the null hypothesis in the context of transfer evidence—association of two objects, rather than source determination. As we have discussed in our book (Inman and Rudin, 2000) and previous columns (Rudin and Inman, 2002, 2002a), transfer evidence provides the link between two objects (one or both of which may be a person). So, in this example the null hypothesis must be, contact occurred between a source and a target. Does failure to find such evidence disprove the hypothesis? The astute reader will immediately translate this question into the classical conundrum, is absence of evidence, evidence of absence? As this concept has been discussed at length

previously (Inman and Rudin, 2000, Rudin and Inman, 2002), we won't belabor the point here. We only point out that, in the framework of strict hypothesis testing, this leaves us in forensic no man's land.

For those who are uncomfortable stating a null hypothesis, especially one that makes a positive association between evidence and source or between source and target, might we suggest that an alternative tool exists. In a Bayesian framework competing hypotheses are compared and their relative likelihood calculated. (Evett, 1983, Taroni, et al., 1998, Champod et al., 1999, Cook et al., 1999, Aitken et al., 2002) Articulating two alternative hypotheses removes both the problem of trying to use a negative to disprove a single hypothesis, as well as identifying which is the null hypothesis in the first place. For our previous discussions of likelihood ratios in a forensic context, see Inman and Rudin, 2000, Rudin and Inman, 2002. Like statistics, philosophical frameworks are tools; both logical frameworks find a use in forensic science, and one may be more useful than another at various stages in the process. And we leave that as yet another topic for a future discussion.

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<sup>1</sup> Even this is a bolder statement than is truly warranted. A hypothesis is tested by a *test statistic*, and the analyst sets an *a priori* error threshold that determines when the null is rejected, and when it fails to be rejected. When a test statistic is involved, a hypothesis is never truly disproven, only rejected or not with some predictable error for either possibility.

# Genesis of the California Association of Criminalists

When I first entered into the field of criminalistics in 1947 in the California State Crime Laboratory in Sacramento, the only existing organization for the exchange of professional information in identification work was the California Division of the International Association for Identification. This small group had

its origins in the identification officers of the Berkeley, Oakland and San Francisco Police Departments, of Alameda County Sheriff's Department and some of the other major cities and counties in California. This group had formed in earlier years and was responsible for the formation of the statewide fingerprint bureau in the California Department of Justice in Sacramento. This state unit developed into the Criminal Identification and Investigation Division which included a technical laboratory Section. The laboratory when I joined the staff in 1947 was staffed by Roger S. Greene and David Q. Burd.

Dave Burd took me to an IAI meeting one evening where I met the leaders of the identification bureaus. This was a very serious group of fingerprint specialists who were hungry for information on new scientific approaches to physical evidence identification processes. At that time, they performed the role of what we now know as crime scene search technicians and coordinated the physical evidence collection work within their respective departments. Some had gone so far as to acquire microscopes and performed bullet comparisons and document examinations. The group looked to us in the laboratory for help and guidance in physical evidence utilization with a great deal of fervor and zeal. Consequently, we were frequently asked to present program material for their continued education. They also provided significant political support for the inauguration of local crime laboratories.

In those days, the terms *criminalistics* and *criminalist* were not in use. Those of us in the state crime laboratory had civil service position titles of criminologist. It remained for James P. Osterburg to publish "An Introduction to Criminalistics" in 1949, which marked the beginning of the usage of the terms in this county. "Crime Investigation" by Paul L. Kirk in 1953 closely followed and gave full meaning to

"criminalistics." Chapter 33 of his first edition contains doctrine which is worth frequent review.

This was the scenario in which the embryo of the C.A.C. was formed. In 1953 I attended a state meeting of the IAI in Laguna Beach together with my colleague, James W. Brackett, Jr. There for the first time we met Ray Pinker and Clark Sellers, of Los Angeles, who were also on the program. It was our first opportunity to talk shop with someone in criminalistics from California. We learned from Ray Pinker the identities of other crime laboratory people in Southern California. In our discus-

sions we thought that it would be of value to have a shop talk meeting of all criminalists in California.

In February 1953 I sent letters of invitation to every criminalist in California (there were only 16) to attend a seminar session on April 11, 1953 to present and discuss current technical developments and professional matters. The meeting was held on that date at the laboratory of criminalistics, Dept. of District Attorney, San Jose, which was located in the Santa Clara County Hospital. The meeting took place in the hospital library because the laboratory contained only 600 square feet of well used space. In 1954 a formal organization was formed with the name *Califor*-

nia Association of Criminalists.

It was agreed to not schedule a meeting for a particular date unless it would accommodate a hundred percent of the invitees. The group was so small that the consensus was that the import of meeting content would be wasted without 100 percent participation. During the early years, missing two consecutive meetings was grounds for expulsion.

I was elected executive secretary and held that position for four consecutive years. There were no dues, only periodic assessments to meet costs which were very small. We published a newsletter of abstracts that were presented at seminars. The constitution was changed eventually to provide for a president and other officers. I published "The California Association of Criminalists" in the *Journal of Criminal Law, Criminology and Police Science,* Vol. 53, No. 3, Sept. 1962, announcing our existence.

In 1963, Paul L. Kirk and I attended the first International Meeting in Forensic Toxicology in London. There we met members of the Forensic Science Society (of Great Britain). We worked out an arrangement for the C.A.C. to utilize the *Journal of Forensic Science* (organ of The Forensic Science Society) as our official publication after the *Journal of Forensic Sciences* (organ of The American Academy of Forensic Sciences) had rejected us.

Meanwhile, the semiannual seminars continued like clockwork so that the meeting in San Francisco in the spring of 1983 marked the 30th anniversary of the C.A.C. and its seminars. Aside from bringing forth an exchange of information forum, our greatest achievement has been the creation of a *Code of Ethics*, which has had a significant impact upon the profession.

The people present at the first meeting were as follows:

James W. Brackett, Jr., Asst. Criminalist, Santa Clara Co.; Lowell W. Bradford, Director,

Laboratory of Criminalistics, Santa Clara Co.; Ronald J. Briglia, Asst. Criminalist, Orange Co.; David Q. Burd, Criminologist, State of Calif.; W. J. Cadman, Chief Criminalist, Orange Co.; John E. Davis, Criminalist, Oakland PD; Patrick Fuller, Asst. Criminalist, Oakland PD; Roger S. Greene, Criminologist, State of Calif.; Donald Harding, Criminalist, Pasadena PD; Lee F. Jones, Forensic Chemist, Los Angeles PD; Paul L. Kirk, Prof. of Criminalistics, U.C., Berkeley; George Lacey, Chief Forensic Chemist, LA Sheriff; Raymond Pinker, Chief Forensic Chemist, LAPD; Hillard Reeves, Criminalist, Richmond PD.



**"Dave Burd took** 

ing one evening

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bureaus. This was

leaders of the

identification

a very serious

group of finger-

print specialists

new scientific

approaches to

identification

processes."

who were hungry

for information on

physical evidence

-Lowell W.

**Bradford** 

me to an IAI meet-

# 100th Beach

Huntington Beach was the venue for the 100th semiannual seminar, hosted by the LA county coroner's lab. The program began with workshops in technical writing, DNA, alcohol topics, and a live burn demonstration at a nearby fire department training facility. Overall, the seminar saw 290 attendees including 145 full registrants.



(Above) California Attorney General Bill Lockyer poses along with seminar organizers Dan Anderson and Tiffany Kuwahara and LA Coroner Dr. Lakshmanan Sathyavagiswaran for pho-

tos following his morning address welcoming attendees to the 50th anniversary of the CAC. *(Below)* Vendors and meeting participants mingle.





Photos by John Houde of Calico Press, LLC.



The Fun with Fire Workshop at the Huntington Beach CAC Seminar was quite a success. Some 22 attendees included criminalists from all over California plus Nevada and New Mexico, and three applications specialists from Varian. Four cubicles were burned (two accelerated and two non-accelerated) to varying degrees of damage. Temperature data were collected via thermocouples. All four scenes were excavated and documented by the teams. When the photos, videos and other data are collected and consolidated, a report will be prepared for the *CACNews*. (The thermocouple data was sent to all participants along with their certificates.)

As the instructor, I wanted to thank our construction crew: Jon Babicka, Eric Fritz, Edgardo Eugenio and Collin Yamauchi of LAPD and Chris Breyer of HBPD (who coordinated all the on-site arrangements). The cubicles were pre-fabricated by Steve Merrill and Mark Jenkins of the LAPD Supply Division Woodshop. Furniture and decorations were donated by Vicki Clawson and Phil Teramoto of LASD and Edgardo and Collin from LAPD (who also transported the City of Los Angeles contributions).

Thanks also go to Al Marland and the firefighters of Huntington Beach FD, Collin, Tiffany Kuwahara, Chris Breyer and Raymond Davis for all their special efforts that made the class a success, and to the CAC Seminar for their sponsorship. John D. DeHaan, Ph.D.









After the cubicles burned to a point termed "flashover," they were extinguished by members of the Huntington Beach Fire Department. Some of the cubicles reached flashover in just a couple of minutes. Others took over 20 minutes. Participants then sifted through the evidence looking for signs of criminal activity. One cubicle even included a "fatal" in the form of a butchered hog.





CAC founders (below l-r) Jim Brackett, Lowell Bradford and W. Jack Cadman, along with their familes, enjoy the honor and presentation.











(Above) Eric Barloewen of the Santa Clara County Crime Lab spiking the volleyball for the "SWGBALL" team at the Beach Bash Banquet Volleyball game. (top) Cassandra Musgrave-Nelson of the Santa Clara County Crime Lab gives the limbo contest her best shot. Photos courtesy of Brooke Barloewen.





















CAC President Michael Parigian thanks the seminar planning team which included (l-r) Eucen Fu, Dan Anderson, Kristina Fritz, Michelle Sandberg, Henry Tuazon, and Eric Wahoske.









# Vanishing Without a Trace?

By the time you read this article, somewhere another article is being written describing how forensic DNA technology has cracked another case. While the benefits of DNA technology pile up like cars in a traffic jam, the DNA revolution is forcing other forensic specialties to re-examine and justify their value or accept playing a smaller game. On both sides of the Atlantic trace evidence examiners are addressing the same question: "What is the value of trace evidence in a DNA world?" This is the question this article will explore.

Eighteen years ago, the first DNA case impacted the forensic community like a line drive over the center field fence that just kept going. Today, DNA technology is forcing forensic laboratories and the courts to rethink how they treat forensic evidence<sup>1</sup>. This process is not without repercussions. For instance, there exists a collective resentment by other, historically more traditional, forensic disciplines toward the DNA hurricane and its practitioners. If you doubt this is true, try listening at conferences, study groups or friendly chats over a beer whenever non-DNA scientists gather.

#### **Old versus New**

Ostensibly, this is a devolutionary tale of the old forensic science's metamorphosis into the new forensic science. Trace analysis is the lionized Edmund Locard, neck cramps over a microscope, the scientific method, intuition, subjectivity, and being able to think your way out of a paper bag. Forensic DNA technology is home to ivory tower PhD's, automation, one in a trillion probabilities, objectivity, repetition and, above all, strict adherence to standardized protocol.

In the Golden State, trace evidence analysis is a lot like the federal Witness Protection Program—it's out there somewhere, but you're not sure where. Tiny pockets of trace examiners, many growing long in the tooth, are sprinkled throughout the state operating, for the most part, on withering budgets and working with antiquated instrumentation. In Europe, by contrast, trace analysis remains a dynamic, well-funded investigative tool, co-existing satisfactorily (for the most part) with the new kid on the block, DNA.

### **Abbreviated Trace Career**

While earning my MSc in Great Britain, I pursued my interest in trace evidence and wrote my thesis on trace analysis of British petrol. That's gasoline to us Colonists. When a trace position opened in Scotland, I gave it serious consideration before a trusted colleague back home suggested it was a deadend career move if I ever returned to California. I accepted that my short trace 'career' had run its course and I returned to the DNA world of pipettes and microcentrifuge tubes.



Dianne Burns DOJ Berkeley To maintain a connection to the trace field, I frequently attend the Northern California CAC Trace Evidence Study Group. This group is never a big draw - the same eight or ten faces facilitate the discussion with the occasional first timer dropping by. Everyone is on a first name basis. Down the hall, the joint is jumping – a mini-convention of DNA analysts congregating for their study group. The two groups may convene under the same roof, but practically speaking these practitioners operate in different worlds. However, they share more than they may realize.

### The Big Picture

Every criminal investigation involving physical evidence proceeds along a two-track process: the legal track and the analytical track. Police officials and the courts constitute the legal track. Forensic scientists comprise the analytical track, applying analytical techniques and expert testimony to the evidence supplied to them, for the most part, by the legal track.

Regardless of the scientific technique a scientist chooses to apply to the evidence, the fundamental legal question remains unchanged: "Is the evidence sufficient to prove guilt beyond a reasonable doubt?" Does it matter whether capillary electrophoresis or a polarizing microscope provides the answers? I think not, but the genie is out of the bottle and DNA is the eight hundred pound gorilla that is impossible to ignore.

"We have no better tool to fight crime, to bring closure to victims, exonerate the innocent and take violent offenders off the street," says Lisa Kahn, the Los Angeles County Deputy District Attorney who is in charge of forensic services.<sup>2</sup> Gary Cortner, an experienced trace examiner and a long time veteran of the California Department of Justice system puts it more simply: "DNA gives you the most bang for the buck."<sup>3</sup>

## The Probative Value of Trace Evidence

Criminal cases once destined for trace analysis are now the domain of DNA. This is understandable given that DNA can provide the proof of guilt or innocence. Why waste valuable laboratory time puttering around on a Vespa when you have the keys to the Ferrari? Does this mean that trace analysis is passé? I don't believe so. DNA cannot be the Tooth Ferry, the Easter Bunny and Santa Claus all rolled into one.

There will always be violent crime cases in which DNA cannot play a role.<sup>4</sup> For example, arson and explosion investigations readily lend themselves to trace analysis. Determining point(s) of origin, analyzing flammable residues, and the identification of explosives are all generated through the collection of trace evidence. Likewise, trace remains an essential consideration in hit and run accidents, shooting scene reconstruction, tool mark and impression evidence and, as a recent issue of the CACNEWS proved, soil analysis<sup>5</sup>.

Quite simply, what if no biological evidence is left at a crime scene? Trace evidence can often provide investigative leads, especially in serial cases and stranger abductions where repeated or unique physical associations can lead an investigation in the right direction.

At crime scenes, trace can help explain observations, relationships, or objects that may help to reconstruct the events that occurred.

For cases in which biological evidence is collected, the relevant question is: "How did the DNA get here?" The circumstances in which evidence is recovered should always be scrutinized because no single piece of evidence can guarantee a slam-dunk conviction. For example, there may be a reasonable explanation for the presence of someone's DNA at a crime scene or - and we may be seeing this more frequently – DNA evidence is staged. I like what Luke Haag heard Ed Blake saying at a CAC Seminar: "If, in your analysis, you do not consider reasonable alternative explanations for an event, what you are doing is not science."<sup>6</sup>

According to two well-known European trace analysts, DNA is recovered from British crime scenes only 5% of the time.<sup>7</sup> This number seems low to me, but even if the actual figure is closer to, say, 50%, there remains a slew of cases with no DNA evidence. I suspect that DNA recovery is not as common as many people, especially police, assume.

When working at the Police Crime Laboratory in Edinburgh, it was not uncommon for police investigators to limit evidence collection from violent scenes to that which could provide DNA. This policy kept the trace instrumentation dormant. My feeling is this emphasis on DNA collection is not an uncommon occurrence. There tends to be a belief among prosecuting agencies that DNA can provide all the answers, relatively economically.

There are no panaceas, and DNA and Trace are no exceptions to this rule. Well before the arrival of DNA, trace evidence's deficiencies were well documented. Trace is *class evidence* incapable, except in rare cases, of conclusively indicating a specific source of origin.<sup>8</sup> For this reason trace will never lend itself to DNA's 'one in a trillion" statistical proof. Secondly, trace evidence *is not cost effective*. New equipment is expensive and as Gary Cortner told me, "gone are the days when a supervisor can afford assigning a criminalist two hundred hours to sort through fibers under a microscope."<sup>9</sup>

In general, trace may have no evidential value when the victim and suspect are acquaintances or when the environment may be too contaminated for trace examination.<sup>10</sup> For example, the back seat of a taxicab may have countless hairs and fibers from dozens of different people. Trace is most beneficial when contact is between strangers in a controlled environment such as a car trunk or a bedroom.

#### **Results Through Collaboration**

Before DNA can work its magic it must first be recognized and properly collected. Since crime scenes are the genesis of forensic science, if it isn't collected, it can't be analyzed. A recent case involving a Southern California burglar and would-be rapist illustrates how trace evidence collaborating with DNA can solve a case.

During the night, a man broke into the victim's home, beat her and attempted to rape her while she was sleeping. The woman successfully fought off her attacker with the help of her black-and-white dog, Casper. The overwhelmed intruder escaped, unknowingly departing with Casper still attached to him in the form of Casper's hair.

The next day, investigators acting on a tip, tape lifted hairs from a pair of trousers taken from the bedroom of a man living in the victim's neighborhood. Hair from the lift and a reference sample taken from Casper were statistically matched. Scientists at U.C. Davis (using STR's and custom designed primers) determined that the odds the hair on the suspect's pants came from a dog other than Casper were about one in 230 million when compared to all 470 breeds in the database.<sup>11</sup> The suspect was arrested and a jury convicted him of the crime. Like a slick series of jabs preceding the inescapable knockout punch, trace evidence set-up this case before DNA finished it off. Trace evidence analysts need to blow their own horn more often. At forensic conferences, more "Casper cases" need to be presented. At the last half-dozen seminars I have attended, trace keeps revisiting the same old stale power point presentations about Locard's transfer theory that I find so 20<sup>th</sup> century. The theory, while important, has gone well past its "sell-by" date. I personally am fascinated by actual cases illustrating how transfer evidence helps to solve crimes. Trace evidence needn't be repetitive, antiquated or boring.

There is a bright spot on the horizon. The Sacramento County District Attorney's Laboratory of Forensic Services has received a multi-million dollar grant to equip a state of the art Trace Evidence Resource Center with sophisticated analytical instrumentation. Lab director Bob Jarzen pushed the concept through the necessary bureaucratic hoops, providing his staff of top-notch trace examiners the resources they need to take trace evidence to the next level. Instrumentation with higher sensitivity and lower levels of detection will provide trace evidence with a much-needed shot in the arm. Most importantly, this will be a shared resource. Use of the center is made available to other trace specialists outside the Sacramento County Laboratory.

Like all newlyweds, the marriage between DNA and general Criminalistics appears optimistic, but prospects for longterm happiness remain to be seen. It is not difficult to envision smaller, non-DNA laboratories becoming economically burdensome as the legal system's demand for DNA increases. Consolidating smaller laboratories into cost efficient, high throughput, mega complexes could be the trend of the future.

Some questions are more immediate. How will trace evidence examination be affected by the expectant retirement wave that will crash ashore in the next few years? Several dozen criminalists will be retiring soon and when they leave they will take with them knowledge that should be passed on.

Whatever the future holds, trace evidence is more than just a barnacle on the hull of the ocean liner USS DNA. Trace remains an effective investigative tool that can stand on its own or lend an assist to the individualizing powers of DNA. The two disciplines need not be mutually exclusive.

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# A defense attorney was cross-examining

- a Chicago police officer during a felony trial it went like this:
- Q. Officer, did you see my client fleeing the scene?
- A. No sir, but I subsequently observed a person matching the description of the offender running several blocks away.
- Q. Officer, who provided this description?
- A. The officer who responded to the scene.
- Q. A fellow officer provided the description of this so-called offender. Do you trust your fellow officers?
- A. Yes sir, with my life.
- Q. With your life? Let me ask you this then officer — do you have a locker room in the police station — a room where you change your clothes in preparation for your daily duties?
- A. Yes sir, we do.
- Q. And do you have a locker in that room?
- A. Yes sir, I do.
- Q. And do you have a lock on your locker?
- A. Yes sir.
- Q. Now why is it, officer, if you trust your fellow officers with your life, that you find it necessary to lock your locker in a room you share with those same officers?
- A. You see sir, we share the building with a court complex, and sometimes lawyers have been known to walk through that room.
- With that, the courtroom erupted in laughter, and a prompt recess was called.
- The officer on the stand has been nominated for this year's "Best comeback" line.

## **BOOK REVIEW**

# The Real World of C.S.I.

## Crime Scene



by Larry Ragle ISBN0380773791 \$7.50 Paperback

This is the second edition of a pocket book regarding criminalistics. I had a hard time deciding if it was meant to be a technical book for investigators or an anthology of short crime scenes for the general public. I had two laypersons read the book as well as me. They enjoyed

the crime scene tales but the technical material turned them off.

I, too, enjoyed the crime scene tales as they stressed an open-minded team approach to the job. These stories also showed the insights of Mr. Ragle at the crime scenes. Not that he stresses his role, in fact, you have to read between the lines to realize that his insights were the difference in making the case.

There are sections devoted to the structure of law enforcement and the role of the various agencies involved in the investigation of crime. He also describes the tests that are used in the laboratory in a logical manner. Sometimes he gets too technical for the layperson but not technical enough for someone to use this as a laboratory reference.

The book is a very good reference for the beginning forensic scientist or investigator.

—Jerry Chisum

# California Association of Criminalists Joint meeting with Northwest Association of Forensic Scientists April 7-11, 2003 El Dorado Hotel, Reno, NV For information, contact Suzanne Harmon 775.328.2811 sharmon@mail.co.washoe.nv.us

# When Great Minds Join,





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