



The President's Desk

No Illusions

James Madison (4th President of the United States and one of the primary authors of the Constitution) stated:

"Justice is the end of government. It is the end of civil society. It ever has been and every(sic) will be pursued until it be obtained, or until liberty be lost in the pursuit."

So it is that the founders of this great country viewed the importance of justice in the United States. In their combined wisdom, they gave this country the tools, in the form of the United States Constitution and the Bill of Rights, among others, necessary to continue with the quest for justice.

Even today, with the emotional subject of terrorists on trial for their egregious acts, there is a very real concern for true justice and protection of an individual's right to a fair trial. When crime is prosecuted by the United States justice system, our citizens have deemed these rights applicable to all people on the planet regardless of citizenship.

I have no illusions that our system is perfect—far from it. Unjust acts based on race that were either allowed to occur, or were perpetrated by our government in the 20th century, are examples of how our system can ignore or misinterpret the very documents that form the foundation of this country. As long as people are involved in the justice system, there will always be differences of opinion in interpretation concerning those documents, some leading to unjust mistakes. We've made great strides in the relatively brief time encompassing my lifetime. I've been privileged to see many racial, religious, and gender barriers to justice and equality broken or significantly weakened. While we, as a society, grow and learn from our past, I believe that our quest for justice will become more defined and successful, but never easier.

Criminalistics, as a profession, is part of that pursuit of justice. As such, take pride that you are one of many forensic scientists working together to provide liberty and justice for indi-

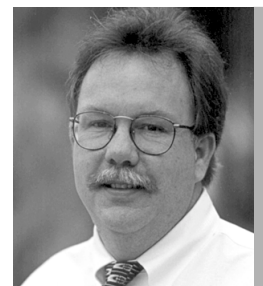
viduals in our society. Through science we should provide accurate data and unbiased interpretations that will help the trier-of-fact decide what the truth is. Our responsibility is enormous. It is our duty to listen to every perspective and weigh each objectively to determine if it is scientifically valid. We must then adjust our own opinions or interpretations accordingly. At times, alternate interpretations of data will have equal validity. In those cases, each interpretation must be given its due. Science, by its very nature, will change over time; therefore, we must be flexible enough to change with it.

"Encourage and listen well to the words of your subordinates. It is well known that gold lies hidden underground." (Nabeshima Naosigige, 1538-1618, in *Ideals of the Samurai*).

New information or viewpoints can come from any source, both from the journeyman criminalist as well as someone in training, obviously not a new concept. I've had the great opportunity to learn from my mentors, coworkers, and trainees in addition to the countless lessons that I have learned from attorneys. Many of these individuals are members of the CAC. I thank all for the lessons that they have taught me and I look forward to learning more, and passing on what I have learned.



OUR RESPONSIBILITY IS ENORMOUS. IT IS OUR DUTY TO LISTEN TO EVERY PERSPECTIVE AND WEIGH EACH OBJECTIVELY TO DETERMINE IF IT IS SCIENTIFICALLY VALID. WE MUST THEN ADJUST OUR OWN OPINIONS OR INTERPRETATIONS ACCORDINGLY.



Daniel J. Gregonis
CAC President

Second Quarter 2002



On the cover...

A few of the more than forty covers produced for the CACNews over that last ten years. The advent of affordable desktop publishing software made it possible to produce a graphically based newsletter in magazine format.

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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!

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Notice to Contributors: We publish material of interest to our readers and are pleased to receive manuscripts from potential authors. Meetings and course announcements, employment opportunities, etc. are also solicited. Advertisements are also accepted, although a fee is charged for their inclusion in *The CACNews*. Please contact the Advertising Editor for further information. Because of the computerized typesetting employed in *The CACNews*, submissions should be made in the form of MS-DOS compatible files on 3.5 inch floppy disks or by e-mail (vis@pd.sannet.gov). Text files from word processors should be saved as ASCII files without formatting codes, e.g. bold, italic, etc. An accompanying hardcopy of the file should be submitted along with the disk. 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.

CACBits • Section News

Shooting Reconstruction Training Course

From October 14–18, 2002 at the Gunsite Academy, Inc. in Paulden, AZ, with Lucien C. Haag and Michael G. Haag, Instructors.

This 5 day intensive training course is designed for forensic scientists and crime scene investigators who investigate shooting incidents or process shooting scenes. This course, to be held at the famous Gunsite training facility near Prescott, Arizona, will provide the participant with both a theoretical basis and practical experience in evaluating and reconstructing a wide variety of shooting incidents.

The proper use of various tools and instruments necessary for the reconstruction of shooting incidents will also be covered during this 40 hour course.

Firsthand experience into the nature of many typical terminal ballistic events such as bullet penetration, perforation, destabilization, deflection, velocity loss, deformation and projectile ricochet will be demonstrated with a variety of common 'target' materials such as tissue simulants, rubber, glass, sheet metal, wood, drywall, soil and concrete.

Trace evidence considerations at projectile impact sites and on recovered projectiles will also be demonstrated as well as the proper interpretation of the impact sites and the trace evidence materials generated during these impactive events.

Various methods for subsequent empirical testing of actual case situations will be demonstrated during this course.

This training program will include an illustrated syllabus for each participant, classroom lectures with accompanying PowerPoint and video presentations in one of Gunsite's ultramodern classrooms and daily live-fire demonstrations on a special range set up for this purpose. The shooting portion of this course will be followed by firsthand examination of target materials and recovered projectiles. Methods for documenting results and court preparation are also included in this comprehensive program.

The course will conclude with a practical and written examination along with a certificate of completion from the instructors.

Further information regarding this training program can be obtained from Lucien Haag at (480) 488-4445 or at forensicfirearms.com. Information regarding Gunsite can be found at www.gunsite.com.

DNA Analyst

San Bernardino County Sheriff, Scientific Investigations Division, is recruiting for a forensic DNA analyst. This position is grant funded through September 31, 2002 with the expectation that the grant will expire on September 31, 2003. At expiration the position will be eliminated. Salary is \$55,000 per year plus a benefits package.

The successful applicant will have at minimum a BS in a natural science (chemistry, biochemistry, biology, etc.) with college coursework in biochemistry, genetics and molecular biology and training in statistics. Experience in forensic DNA analysis is preferred. The selected applicant will be subject to a background investigation that includes a polygraph examination.

The time period for application will remain open until an applicant is selected. Resumes and copies of relevant college transcripts can be submitted to: Philip M. Kellett, Lab Director, Scientific Invest. Div., 200 S. Lena Road, San Bernardino, CA 92415-0056.

International Symposium

The Australian and New Zealand Forensic Science Society (ACT Branch) is hosting the 16th International Symposium on the Forensic Sciences in Canberra, Australia. The dates are 13-17 May, 2002. For further information, visit the web site at www.nifs.com.au/ANZFSS/Symposium2002.html

Firearms/Toolmark Examiner

The Las Vegas Metropolitan Police Department is recruiting for a Firearms/Toolmark Examiner, starting annual salary is \$52,035. Requirements for this position are a bachelor's degree in criminalistics, forensic science, chemistry, biology or related field and 3 years of responsible research and practical experience working in a forensic laboratory as a professional firearms/toolmark examiner. To apply, please obtain an Employment and Supplemental Application by contacting the LVMPD Personnel Bureau, 101 E. Convention Center Drive, Suite P200, Las Vegas, NV 89109, (702) 229-3497, M-F, 8:00a - 4:00p. The deadline for applying is Friday, May 31, 2002, or when a sufficient number of qualified individuals have submitted application packages. The LVMPD offers excellent benefits. For additional information, please visit www.lvmpd.com.

The LVMPD also anticipates recruiting for the position of Latent Print Examiner in the near future. Look out for information on this position as it becomes available.

IAFS Meeting in France

The 16th meeting of the International Association of Forensic Sciences will meet from September 2–7, 2002 in Montpellier, France. The "call for papers" of the IAFS 2002 thematic sessions will be available on the meeting's website : www.iafs2002.com, as well as the sessions in development : plenaries, continuous education, special sessions, breakfast seminars, round tables, workshops. IAFS 2002 Scientific Secretariat, SOCIETE INTERNATIONALE DE CONGRES ET SERVICES, 337, rue de la Combe Caude, 34090 MONTPELLIER - France, Phone : +33 (0)4 67 63 53 40, Fax : +33 (0)4 67 41 94 27, E-mail : algcsi@mnet.fr, www.iafs2002.com

Fire and Explosives Meeting

On July 25th and 26th, 2002 the California Fire and Explosives Analysts will host their 2nd annual seminar at the Embassy Suites hotel on Monterey Bay. This association sponsors the training and continued education of forensic scientists and draws individuals from many areas of the country. For more information, please contact Kristin Rogahn, Ventura County Sheriff's Crime Lab at (805) 654-3063, or by email at Kristin.rogahn@mail.co.ventura.ca.us.

CCI's New Web Site On Line

The new California Criminalistics Institute web site, at www.cci.ca.gov was designed to be more useful and user-friendly. With its fixed navigation bar to the left and cleaner layout, users will quickly find class descriptions, class schedules, and other useful information. Shannon Tulleners, a recent graduate from CSU, Monterey, designed the site. Shannon worked closely with CCI's "webmaster," John Rush, to make

Jobs • Meetings • Courses

site navigation easy and intuitive. The sophisticated design of the site, with its embedded databases, allows CCI to make changes quickly.

With its new address, CCI's site will be easier to remember and find. CAC web site's link to CCI will also help the forensic community find the site. Physically located at California's Teale Data Center, CCI's site should show much better reliability and security.

Updated Physical Evidence Bulletins (PEBs) and application forms, features of the new site, are available from the CCI Resources page. These PEBs provide guidance in the collection of many types of evidence investigators may encounter at crime scenes. PEBs may be copied and distributed freely. For students unfamiliar with Sacramento and its environs, the Visitor's Information Page will also provide useful guidance.

DNA Technical Leader

The Ohio Attorney General's Office, Bureau of Criminal Identification & Investigation's Laboratory, Richfield, Ohio is seeking applicants for the position of DNA Technical Leader (position title: Crime Laboratory Director). The successful candidate will possess these preferred qualifications: previous experience as a DNA Technical Leader or eligibility for DNA Technical Leadership as defined by the FBI Director's Quality Assurance Standards for forensic DNA typing laboratories (DAB Standards). Minimum qualifications are completion of MS (or equivalent) in physical or biological science (e.g., chemistry, biology, or physics); 3 years experience in analytical testing & evaluation of evidence in criminal matters, or completion of undergraduate degree, (e.g., BS, BA or equivalent) in physical or biological science; 4 years analytical testing & evaluation of evidence in criminal matters, or 6 years training or 6 years experience in physical or biological science that includes 3 years experience in analytical testing & evaluation of evidence in criminal matters. Responsibilities include supervising clerical & crime laboratory personnel & technically leading forensic scientists conducting forensic DNA testing; coordinating all activities within laboratory; conducting studies, surveys & operational evaluations; overseeing laboratory examinations, court schedules & reports to law enforcement; assisting crime scene investigative units; assigning section work functions & determining assistance requirements; ensuring compliance with policies, procedures, directives & laboratory accreditation standards; testifying as an expert witness. May be exposed to caustic chemicals, odors, firearms, & drugs. Salary: \$53,477 - \$70,117.

Contact: Ohio Attorney General's Office/BCI&I, Personnel Office P.O. Box 365, London, Ohio 43140.

AFTE Meeting in Texas

The Association of Firearm and Toolmark Examiners (AFTE) will convene its 33rd Annual Training Conference May 26-31, 2002 at the Adam's Mark Riverwalk Hotel, San Antonio, Texas. Contact: Bexar County Criminal Investigation Laboratory, 7337 Louis Pasteur, San Antonio, TX 78229. e-mail: jbecker@co.bexar.tx.us, www.afte.org

Human Identification Symposium

The 13th International Symposium on Human Identification will be held October 7-10, 2002 at the Pointe Hilton Tapitio

Cliffs Resort, Phoenix, AZ. Contact: Mary Streveler Meeting Coordinator, Promega Corporation, 2800 Woods Hollow Rd, Madison, WI 53711. E-mail: mstreveler@promega.com, <http://www.promega.com/geneticsymp13/>, Phone:608-298-4651 (voice) 608-273-6455 (fax).

Selections from the membership secretary's "CAC E-News Update"

- Senate Bill 1103 (MDMA) died in committee on Jan 15, 2002.
- Applications for Endowment Funding of training classes must be submitted to the Training and Resources Committee Chair by Friday, March 1, 2002. The "Training Proposal and Application for Endowment Funding" form is available on the Training page of the website and includes directions for submission. Questions should be directed to Patricia Lough at pk1@pd.sannet.gov.
- A "Study Group Organizers" Form is now posted on the upcoming Events page of the website. Host laboratories should use this form to submit Study Group information for posting on the website and inclusion in the E-News Update. Use of the form will help us ensure that all pertinent information will be included in future postings. Submission instructions are also posted on the website.
- The new "Training and Resources Survey" form is available on the website. The results of the survey are used to determine which training courses should be funded for the year. In order to have a voice in the process, each member should fill out a survey form. Forms are due by November 1, 2002.
- Assistant Treasurer position: If you are interested in an assistant treasurer position and/or training to become a future treasurer of the CAC, please contact Michelle Fox at mjf@forensica.com or (510) 887-8828.
- The 2002 Member Directory was distributed to all members with the First Quarter 2002 CAC News. Please check your listing for accuracy. Please direct corrections to elissa.mayo@doj.ca.gov.
- CAC dues payments...Please contact Treasurer Michelle fox at mjf@forensica.com or (510) 887-8828 if you have not made your dues payment as delinquent dues letters will be sent out shortly. Unpaid members will be dropped from membership at the May meeting.
- The May, 2002 99th seminar announcement, registration form, venue information and call for papers forms are now available on the CAC website.
- Riverside DOJ Laboratory is in the process of moving into a new facility this month. The current phone number is listed above. After the move, the new address and phone number will be: 7425 Mission Blvd, Riverside, CA. 92509 Phone:(909)361-5000.
- CAC News back issues are available. Please email John Simms at vis@pd.sannet.gov with the issue dates you are interested in. He will check to see if they are available. Please send a self addressed stamped 9 X 12 envelope (\$1.25 postage for 1 issue) to John Simms at: San Diego Police Dept. Crime Lab, 1401 Broadway MS 725, San Diego, CA 92101.

I am an Army of One

The first time I saw this slogan I was at first puzzled, then disappointed. The army had been looking for a new slogan. *Be all that you can be* was the old slogan and it had an immediate positive impact by inferring that the army could help you develop your full potential.

The commercial shows a solitary man running across the dry desert. Heat waves pulsate and sweat is pouring down his face. The voice-over says: *I am an army of one*. I could only wonder what exactly that meant. Doesn't being in the army mean being part of a team, following a chain of command, working together to get the task done?

This new slogan seemed absurd and contradictory. The slogan did make me think about our structures within forensic science. *I am an army of one*. Could there possibly be a forensic application?

One possible meaning referred to being the ultimate fighting machine. The forensic corollary was not attractive: the ultimate do-everything criminalist. Where have we seen that before? The current *CSI* on CBS television is close, but even closer was the television program *Quincy* from years ago. Quincy did almost everything by himself (with occasional help from Sam) and went beyond the boundaries of reality to solve the case. No, I thought, while the ultimate fighting machine may work for the military, it did not tie into forensics very well.

Then another interpretation became apparent. I thought about how we all depend on each other at any given time to make sure integrity of the evidence is maintained, the proper sequence of analyses is conducted, and that the evidence is developed to its full potential.

A report is issued with the analyst's name on it. By all appearances, it looks like the product of single individual. In part, it is. Think, however, about all the behind-the-scenes activities that took place, resulting in that single work product.

First, the evidence had to be collected, preserved, and impounded. Property clerks had to inventory and store the evidence. The clerical staff had to process work requests. Supervisors had to assign the request and track the work.

Finally, the analyst went to work. The work was done,

the report was written, and the reverse process took place: the evidence was repackaged, resealed, and returned to the property room.

The report is distributed. In its finished form, the report has one name on it—the analyst's name. The users of that report see the one name. The *analyst* is the "army of one." But behind the work is a world of support from forensic specialists, clerical staff, and property personnel.

Even with all this support, the analyst does, in fact, face a moment of true individual accountability. It is the moment when the analyst walks into the courtroom, takes the oath, and sits alone on the witness stand. The analyst must now answer for the work done and the analytical choices made. The analyst, though, while alone at that moment in the courtroom, is, in reality, never truly alone because of the entire support network.

I am an army of one. One person can make a difference. The significance of that evidence may strike home with the effective testimony of the analyst. Or, in the event of mishandling by the analyst, or anywhere in the support network, the evidence may be completely discounted. One person can make a difference: that difference can be either positive or negative.

The real significance of being an army of one, I finally realized, was that we are an army of one only in appearance. In reality, we are a team that produces a work product that can make a difference only if the separate components have performed properly.

My thoughts returned to that solitary soldier running across the hot, dry desert. I do understand it now. He is an army of one, as you and I are. He, you, and I, each of us, can make a difference, but not without the support of proper teamwork.

Now, go out and make a difference.



John Simms

CAC Editorial Secretary

John

FEEDBACK

Kudos

I would like to commend you and your staff for an excellent first quarter [2002] issue of the *CACNews*. This issue included an interesting variety of submissions which were both practical and thought provoking, as well as excellent photographs which always enhance our newsletter. Keep up the good work!

Nancy D. McCombs

A Milestone Passed

When then CAC president Carole Sidebotham asked me to volunteer for a committee, little did I know what I would be getting into. Intrigued with a brand new program called Pagemaker, I asked if I could try to make the *CACNews* look more like a magazine. Some forty issues later, I look back in astonishment. What a ride! A big "Thank you" to the CAC for letting me learn the intricacies of desktop publishing on their dime.

John Houde

Candidates for the CAC Board of Directors



Elissa Mayo-Thompson



Brooke Barloewen



Raymond Davis



Pennie Laferty

For President Elect

Pennie Laferty

I have been a criminalist at the Orange County Sheriff's Department for almost twelve years and a member of the CAC for nearly that long. I've been active in the CAC since becoming a member and was the membership secretary for four years (1996-2000). During my term as membership secretary, I saw membership in the organization grow from about 475 members to almost 600. I understand that membership is now over 600 and headed toward 700. Growth is a good thing, but we must not lose sight of what this organization was started for. It was started to provide a forum in which criminalists from all over California could come together for an exchange of information and ideas; not just to discuss methodology, but also ideology. It was established to provide a network of communication and comradery. As president-elect and president, I would work to maintain that ideal and not lose sight of the organization's purpose.

I was asked recently what my agenda would be if I became president. My mentor and friend, Tony Longhetti, was concerned about the lack of professionalism in our field today, and he was right. Many people that are coming into our profession today look on it as just a job. We are "criminalists" — that is our profession! So, my agenda, if you want to call it that, would be to promote professionalism within our organization. I'm not sure how I would do that, but I would do my utmost to conduct myself in a professional manner as president and hopefully lead by example.

For President Elect

Raymond Davis

Hi, I'm Raymond Davis and I'm running for the position of president elect. I joined the CAC in 1979 and served two terms on the board of directors as the editorial secretary. I thoroughly enjoyed the responsibility of producing the *CACNews*. I especially enjoyed working with our Art Director John Houde and publishing the articles contributed by our members. I'm looking forward to serving again, this time as president elect.

I've had a long and successful career in forensic science with several laboratories. I joined the Department of Justice in 1972 and now find myself back with DOJ working at the DNA Laboratory located in Berkeley, CA. Since joining in November 1999, I've been assigned to the method development section where my principle duties are training related. Additionally, I have been a facilitator at the California Criminalistics Institute since 1991 teaching the courtroom presentation of evidence class.

My friend and fellow board member Pennie Laferty is also running for the position of president elect. This is a great opportunity for both of us and I know we will represent the CAC to the best of our ability. I believe that either choice will benefit the CAC. Of course, I'm hoping you'll choose me. Thank you and I look forward to the business meeting in San Francisco with great anticipation.

For Recording Secretary

Brooke Barloewen

I have enjoyed serving as recording secretary for the past two years and would like the opportunity to serve for two more. While on the board of directors, I have refined the duties of the office to make the job easier and have attended all board and business meetings. I feel as though it was just yesterday that I typed my first set of minutes.

I would like the pleasure of being recording secretary for another term and would appreciate your vote.

For Membership Secretary

Elissa Mayo

Thank you for the opportunity to serve as the CAC membership secretary for the past 2 years. I have enjoyed contributing to the development of more efficient ways of disseminating information to our current members as well as finding new ways to attract new members in the process.

Through the use of electronic mail, membership application forms, and postings on the CAC website, I am able to respond more quickly to prospective applicants and members as well as substantially reduce the costs associated with that communication. The centralization of membership forms on the website also ensures that the most current versions are available to applicants, and has virtually eliminated traditional mailings.

I established the *E-News Update*, an electronic newsletter, as an informal way to provide a means for members to share information with each other on a regular basis. So far it has provided information on upcoming study groups, future meetings, and updates to members with more timely information than was previously possible.

With your support I look forward to serving another term as membership secretary.

The Dirt's on You

IN OCTOBER 1999, a woman and her small children accepted a ride from a male acquaintance in Imperial County, California. He took them to an isolated location on the banks of the New River where he raped the mother, slit her throat, and attempted to drown her. He also hit her children with rocks. The victims escaped and hid for thirty hours in the river.

The suspect was arrested only hours after the victims reported the crime. The suspect denied any contact with the victims and claimed to have not been near the crime scene. Soiled and wet clothing and shoes were found at his residence. Detectives also discovered scratches to the suspect's upper left arm and lower legs. The suspect claimed that these were from his girlfriend and from his work.

All sexual assault evidence collected from the victim tested negative for semen. Although fingernail scrapings from



Figure 1

the victim were collected, these were never analyzed due to time constraints. Therefore, soil evidence was examined to help place the suspect at the scene and to corroborate the victims' story.

The crime scene was located to the south of the Salton Sea; northwest of El Centro and adjacent to highway S28 near the New River (Figure 1).

At this location, the New River cuts through different levels of river terraces (Figures 2,3).

The victim was able to pinpoint the area along the river embankment where she and the suspect entered the river during the attack (Figure 4).



Marianne Stam is a senior criminalist with the Calif. Dept of Justice Lab in Riverside, CA.

This paper received the "Most Outstanding Paper" award at the Fall 2001 CAC seminar.



Figures 2 and 3



Figures 4 and 5

I visited the crime scene and noted that at this location, white sediments were distributed on top of tan sediments. These white sediments appeared to be present only along the southern bank and in depressions on the surface of the south side terraces (Figures 5 through 8).



Figure 6

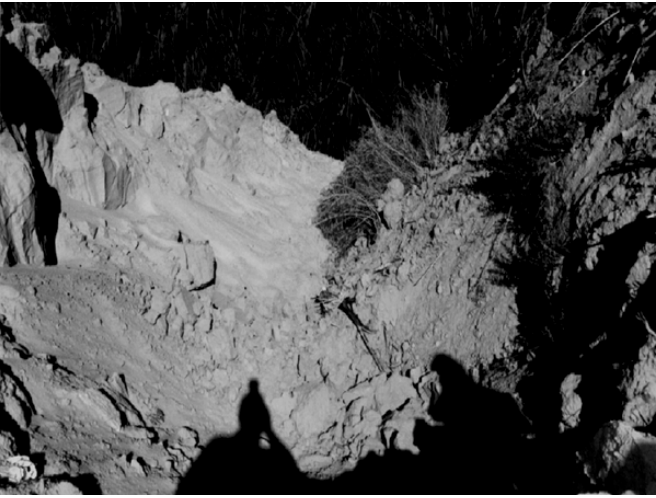


Figure 7

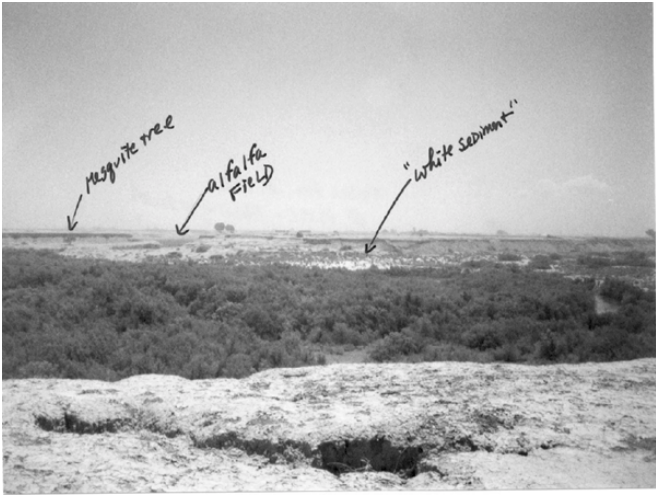


Figure 8

The prevailing wind direction appeared to be from the west and when I visited the scene, the wind was blowing hard from this direction. Several soil samples were collected from the crime scene and the surrounding regions for comparisons to the soil from the suspect's clothes and shoes.

Approximately sixteen grams of soil were removed from the suspect's right shoe. Although other items of the suspect's clothing contained soil of similar appearance, I examined the soil from the suspect's right shoe in more detail because of the large amount that was present. This soil was analyzed and compared to soil from the crime scene using stereomicroscopy, polarized light microscopy, and X-ray diffraction.

The soil samples were examined and compared as whole samples as well as sieved fractions using stereomicroscopy. The sieved fractions consisted of gravel, sand, silt, and clay sizes. Portions of the silt-sized fractions of each sample were separated by density using bromoform into light and heavy minerals and were mounted in 1.54 and 1.65 refractive index oils respectively for polarized light microscopy. The heavy minerals were grouped according to their appearance: colorless, green, or brown.

The soil from the crime scene ravine and the soil on the suspect's right shoe were similar in Munsell Color, mineral grain morphologies, and gross content. Both soil-samples also contained similar small white shells (Figures 9 through 11).

A Malacologist from the Natural History Museum of Los Angeles identified the shells as *Tryonia protea*, a freshwater snail species. Fossil shells of this species were deposited within a natural lake that filled the Salton Sea Basin during the last Ice Age between 10,000 and 50,000 years ago. These shells have a wide distribution throughout the Imperial Valley, thus reducing their significance for comparison.

Polarized light microscopy revealed similar light and heavy minerals in approximately similar abundances in the samples from the crime scene and the sample from the suspect's right shoe. The minerals were not specifically identified, but were categorized according to their possible mineral types (Figures 12 through 15).

VISUAL/STEREOMICROSCOPICAL RESULTS

SAMPLE	MUNSELL COLOR/COLOR	TOTAL WEIGHT (gms)	GROSS CONTENTS
Crime Scene- Ravine (E13610TagB)	10YR/5/3 Brown	28.00	-Vegetation -Soil
Crime Scene- Ravine (E13610TagC)	10YR/6/3 Pale Brown	37.00	-Mineral Grains: angular to sub-rounded. -Small white shells -Vegetation
Suspect's Right Shoe (E13605TagD2)	10YR/6/3 Pale Brown	16.00	-Mineral Grains: angular to sub- rounded. -Small white shells -Vegetation

Figure 9



Figures 10 and 11

Identification of minerals and further comparison of the soil samples was done on the silt-sized fractions by X-ray diffraction at the University of California, Riverside. X-ray diffraction results indicated that the soil samples from the crime scene contained similar minerals to the soil sample from the suspect's shoe (Figure 16).

How significant was this similarity? Returning to the crime scene, the white deposits along the south side of the New River appeared to be limited in their distribution. They were mostly quartz mixed with the small shells. Based on the prevailing wind direction, their source could be large sand deposits to the west of the crime scene (Figure 17).

The presence of these white deposits of limited distribution in the crime scene soil samples and on the suspect's shoe added significance to the observed similarities and helped to corroborate the victims' accounts of the attack as well as place the suspect in the vicinity of the crime scene.

Acknowledgements:

I would like to thank Dr. Robert Graham and Kathy Rose of the University of California, Riverside for their assistance with the X-ray diffraction analysis and interpretation. I would also like to thank James McClean of the Natural History Museum of Los Angeles for assistance with the identification of the snail shells.

LIGHT MINERALS >90<180 MICROMETER FRACTIONS RAVINE SAMPLE AND SUSPECT'S RIGHT SHOE

Mineral #	Possible Mineral Type	Relative Abundance
1	Quartz	Most Abundant
2	Feldspars	2 nd Most Abundant
3	Carbonate Minerals	3 rd Most Abundant
4	Muscovite	Rare
5	Sphene	Rare

Figure 12

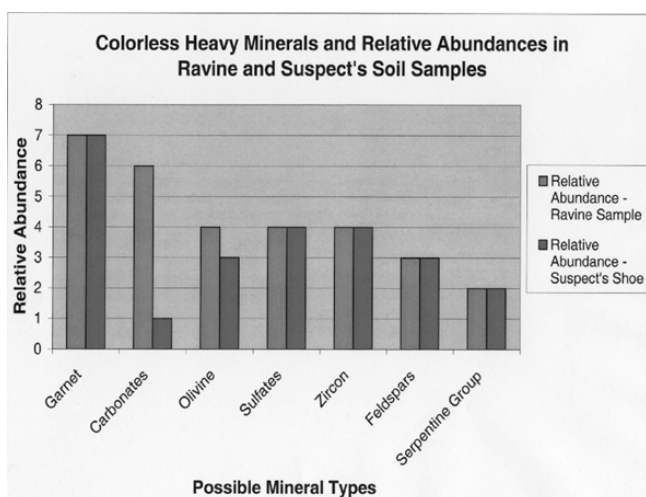


Figure 13

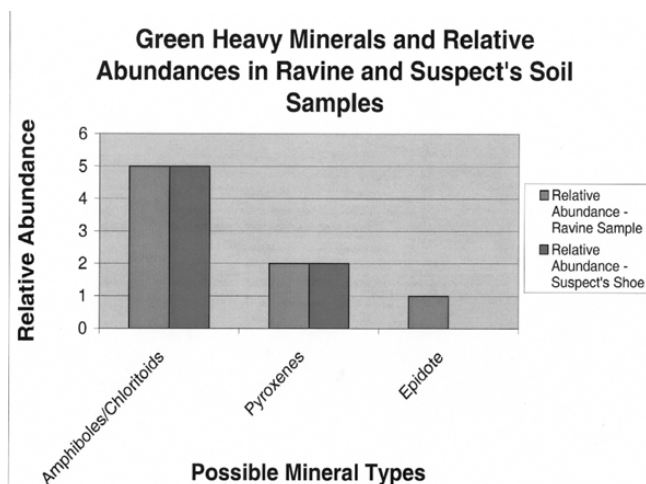


Figure 14

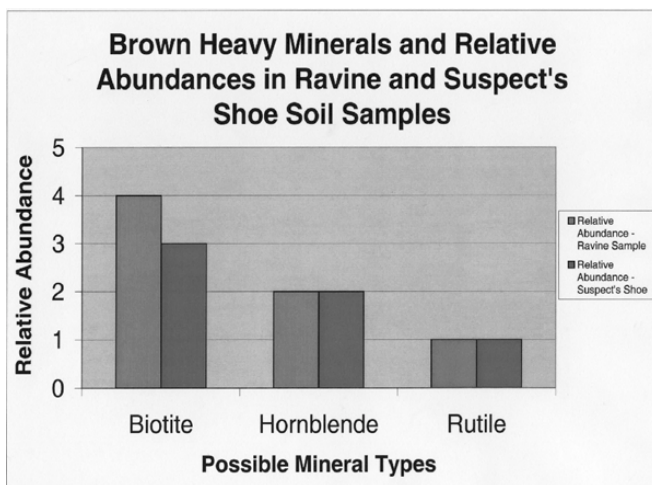


Figure 15

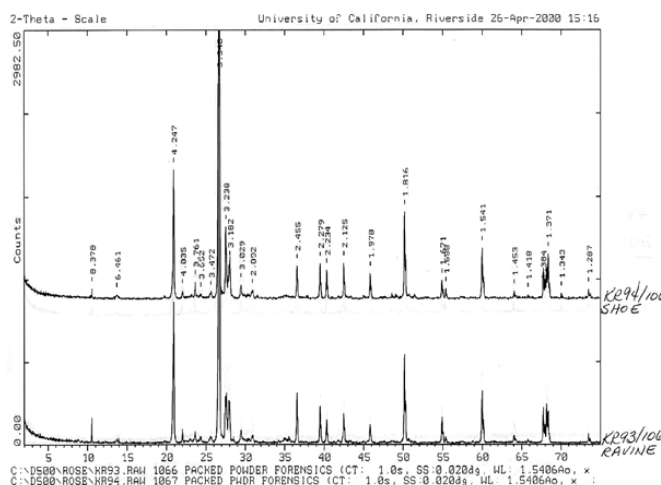


Figure 16

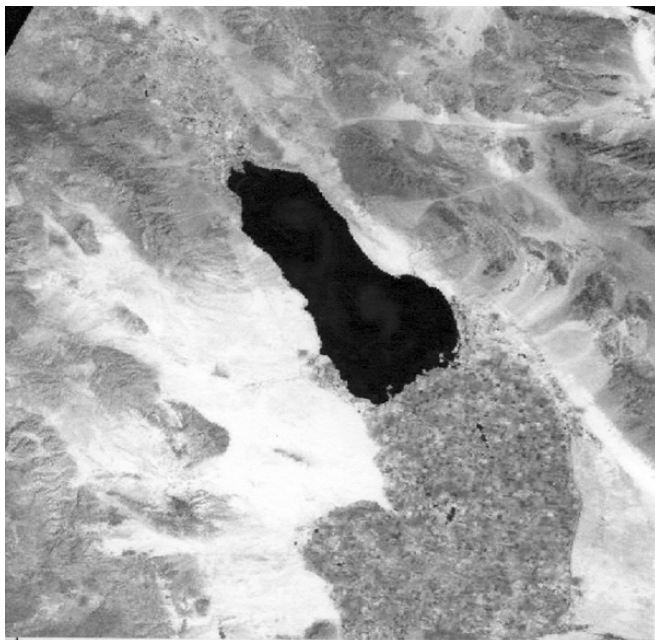


Figure 17

Calling All Microcrystal Drug Chemists

We are planning a publication on the identification of drugs by microcrystal tests as a collaborative effort of the members of the CAC. This will be an easy-to-use reference guide including color photographs, the latest "designer drug" tests, and validation studies.

We are looking for individuals who wish to contribute photographs from their collection, prepare new photographs, do some research, and write sections of the paper. All contributors will be acknowledged.

Sound interesting? Contact the Training and Resources Committee Co-Chair Patricia Lough at 619-531-2460 or email plk@pd.sannet.gov to get involved!



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First Person Essay by Pam Hofsass

Beyond Blue

On October 16, 2001, my 93 year-old Greek grandmother passed away. It wasn't unexpected; she hadn't recovered at all from a fall (3 months prior) where she had broken her arm. But it was still very sad to see my own personal "Rock of Gibraltar" go. The funeral was held in Staten Island, New York on Saturday, October 20, 2001, and although *her* story could easily fill a book, it's not the reason I am writing today.

As a New York City transplant, I felt a strong need to do something, *anything* to help in the efforts of my brothers and sisters in blue, and the people of my roots after 9-11. I fantasized about taking a leave of absence—or getting detailed for a few weeks—or like fellow San Francisco Police Department Officer Rich Benjamin did (my new hero), tell the boss, "I don't care how you carry me, I'm going to New York." I was planning on making a visit on Veteran's Day (3-day holiday) – but due to my grandma's passing, I ended up in New York City for a precious few days in October.

First, I should tell you that my two detective cousins have been working 12-hour shifts ever since the attacks. They were able to get me connected to the right people to get inside the barricades and view up close and personal the carnage (aka Ground Zero), as well as a volunteer "tour of duty" at the Recovery site in Staten Island. Words cannot describe the devastation – so, suffice to say that it is a lasting impression that any form of media cannot compete with. I signed up at the NYPD

Command Post at 0900 hours on Tuesday, October 24th for my volunteer shift.

Muldoon Hill (aka *Fresh Kills*) is a village, a town, and a sanctuary to the archaeological dig for "anything identifiable." The site encompasses around 100 acres of mounds and mounds of rubble consisting of concrete, steel, and reminders of the lives that were lost. There are conveyor belts set up one-story high, in order to sift through extra heavy masses of concrete, steel, etc. There are semi-enclosed domes, set-up with 4-5 "lanes" of debris, gently distributed by the dump trucks. There are trailers upon trailers housing all kinds of specialized personnel (FBI, ATF, and bomb squads for starters). The constant drone of the construction and sifting equipment is deafening, not to mention the dust factor. Every worker is

suiting up with Tyvex, goggles, hard-hat, heavy-duty gloves, personal respirator and most important – earplugs. I was assigned to one of the "domes" and with rake in hand, sifted through the freshly laid piles of debris. I found a graduation gown ("Forest Hills High School"), a piece of a make-up kit, batteries, all sorts of wires, computer parts, shoes and two bones. One of the two bones turned out to be of human origin (rib to be exact) – this information later confirmed by the Forensic Anthropologists at the Crime Scene Investigations (CSI) trailer. CSI personnel then document the human remains with Polaroid and 35mm cameras, then "tags and bags" them. After the documentation process, the material is transported to the DNA Unit in Manhattan for extraction, analysis, and hopefully, identification (or association) with one of the many victims. While hanging out by the CSI trailer, I saw all sorts of bones (some animal, some human), and an intact hand. Two days before, they found an entire human body. Did I mention how incredible it felt just to be there?

Thanks to the anonymous Tyvex suits, nobody really knows who is who (although, the group I was assigned to work with were from the Dept. of Corrections according to my Sarge). At lunch break, the Tyvex comes off, your boots are hosed down by a couple of guys in yet another trailer and finally a chance to see who's who arrives. I can't tell you how many cops came up to me (ever so proud to be wearing my SFPD uniform) and said, "Wow, *Frisco*...you're a long way from home" and I would explain about my grandma dying and spending an extra few days to visit and volunteer. After a while, I came up with "Hey, I'm closer to home than you think – born and raised on Staten Island." To which, most replied- "No, sh—, well, alright, thanks for being here." One guy saw me, hunched over my delicious baked lasagna and salad, stopped dead in his tracks and said "San Francisco...there's a bar by the Pier that makes the best Irish Coffees...I can't think of the name." When I quickly affirmed "Buena Vista Café," his face lit up and related that his favorite vacation was in my city and his favorite bar was the Buena Vista. The rest of my lunch continued in that vein and after an hour, it was back to the trenches.

In the short time that I spent sifting through the rubble, and finding maybe one answer to one family's prayers, I felt an awesome sense of belonging, camaraderie, and purpose. After much loss in my immediate family in the past few years, I drew great comfort and pride to know that I am part of a much larger family – the one in blue.



San Francisco Police Department's Inspector Pam Hofsass gives the big thumbs up to a forensic anthropologist on top of Muldoon Hill, Staten Island, New York, October 24, 2001.

I FANTASIZED
ABOUT TAKING
A LEAVE OF
ABSENCE—OR
LIKE FELLOW SF
POLICE OFFICER
RICH BENJAMIN
DID (MY NEW
HERO), TELL THE
BOSS, "I DON'T
CARE HOW YOU
CARRY ME,
I'M GOING TO
NEW YORK."

QUALITY ASSURED

by Jack Wallace

As I prepare this note, our laboratory is literally packaging and mailing our application for ASCLD/LAB accreditation. I must admit, it is with some trepidation that I await the next major step in this process, specifically the on-site audit of the laboratory's operations. In this mindset I cannot help but ask myself, "What exactly is the goal of this audit, and more generally, what should be the goals of any laboratory audit?" These are central questions not only to the ASCLD/LAB process, but also to quality assurance managers throughout the forensic system who are tasked with auditing their own laboratories.

In contemplating this question, I have considered some commonly held opinions that have proven in final analysis to be unsatisfying. One such view is that audits are held to assure compliance with ASCLD/LAB criteria, as published in their manual. This viewpoint is attractive because it implies that if we only conform to a list of rules, we will achieve accreditation. Referring to the ASCLD/LAB Manual, however, one rapidly realizes that many important criteria are not objective standards, but rather general statements whose implementation is largely a matter of judgment (as is typical of most management decisions). As one of many examples, consider criteria 1.4.1.4: "Is evidence protected from loss, cross transfer, contamination, and/or deleterious change?" Interpreting this crucial criteria against the practices in a specific laboratory clearly requires a good deal of informed judgment on the part of the inspection team, and it is questionable whether more specific criteria could be promulgated given the wide variety of practices currently in place.

This is not to say that *all* ASCLD/LAB criteria are matters of judgment. The ASCLD/LAB Manual does indeed include some very specific criteria in those instances when common agreement was possible, but these tend to be quite limited in scope and generally are not central to the operation of the laboratory. Further, the utility of those criteria that are specific sometimes appears questionable (Why is it essential that "technical support personnel met the requirements of their job descriptions," as is specified in criteria 2.9.1?), thus underscoring the difficulty in framing such criteria.

From time to time I have been reminded that the upcoming inspection is essential to achieving accreditation, and that accreditation is important for obtaining public credibility. In other cases, state funding may be contingent on achieving accreditation. Indeed, these are important motivators but do not in and of themselves explain how the laboratory operation may benefit from an audit. After all, unless audits are truly worthwhile, the appropriate response would be to petition to change the regulations, not to budget for more inspections.

In considering this question, it must be recognized that service laboratories have been in business many years, and there are few if any mistakes or practices that are truly new (aside from obvious technical advances). In this context, I propose that the purpose of an audit is simply this: to rely on the informed judgment of experienced persons to recognize questionable practices in a laboratory before they develop into serious problems. This is not unlike going to a physician who is trained to recognize early symptoms before they develop into a debilitating disease. It is for this reason that we throw our operations open to a group of experienced outsiders and count on their joint experience and wisdom to improve our operation.

In a sense, one might argue that if an issue doesn't matter to the court system, it simply doesn't matter. But this must be understood in the broadest sense, in that laboratories implement innumerable procedures, of which the courts are normally unaware, to assure the reliability and accuracy of the reported results. This is not unlike the automobile engineer who must consider the exact grade of steel, the size and shape of each component, and myriad other details to assure that the end product is reliable and attractive to the consumer. In either case, it is the attention to detail, largely transparent to the client, that makes a quality product.

Recognizing why audits are performed has several implications regarding how they are carried out:

Who is qualified to perform an audit? Because of the central role of informed judgment in the audit process, inspectors must be experienced managers and scientists. The thought that junior staff equipped with a checklist can perform audits trivializes the entire process.

What is the role of a checklist? Checklists are helpful for structuring the audit and for assuring that key issues are addressed. However, inspectors must not limit themselves to the checklist when important issues become apparent during the audit. Indeed, it is my personal experience as an auditor in the environmental field that important findings are seldom contained in the checklist.

How does one assess the importance of an observation? The significance of an observation is based on its potential impact on the justice system. It might be noted that this does not entirely fit with the ASCLD/LAB approach, which classifies, for instance, sample custody issues as essential without regard to the significance of the observed practice. How then does the inspection team address trivial violations of "essential" criteria?

How should audit findings be presented? Audit findings must be expressed in terms of their impact on the justice system. (In most cases this is self-evident.) Likewise, avoid justifying a finding by referring to ASCLD/LAB criteria, since there must be a more compelling reason. Simply put, if an issue can't be addressed in terms of its potential effect on the justice system, it's probably not a problem.

Does it suffice that a laboratory is in compliance with its own SOPs? No. The laboratory's practices must be both documented and efficacious.

Finally, given the inevitable role of judgment in the audit process, how does one protect against the poorly informed inspector who makes unreasonable demands on the laboratory? In summary, this valid concern is typically addressed by (a) restricting the audit team to making observations and recommendations, while final decisions are made by a third party, and (b) informing the laboratory at all stages and allowing them to comment on all issues before making any decision. This is basically standard policy employed by ASCLD/LAB as well as other auditing agencies.

These guidelines apply equally well whether one is performing an internal audit of one's own laboratory, or an external audit on behalf of ASCLD/LAB or another organization.

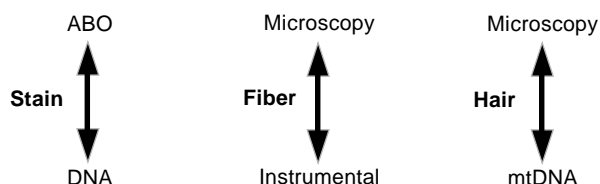
In a sense one might compare the audit team to a visiting uncle who insists on providing child-rearing advice. The uncle cannot know the child as well as the parents and doesn't have to live with the results, but if the uncle happens to be an expert on the subject his advice should at least be taken seriously. In the case of an audit, the laboratory is in the best position to decide how best to implement applicable standards, consistent with its client's needs and the requirements of the accrediting agency.

How Far Should an Analyst Go?

A reader of our last Proceedings remarked on our penchant for commenting on the beverage that precedes our discussion. In all fairness, the food is equally compelling (if less mentally lubricating), and sets the plate (so to speak) for today's discussion. While studying the menu, we realized that we evaluate all of the items on the menu before deciding what to order. The vegetables must go well with the meat (for one of us), or the various ingredients of the salad must blend into a pleasing combination of tastes. In some ways, a case presented to a criminalist also contains several ingredients, and leads us to pose the following question: when a case contains multiple items of evidence about which several questions have been asked, leading to various different laboratory examinations, what, if any, limits should be imposed on a criminalist's opinion? Should she write a report where the results from one type of examination are included in the interpretation of another examination of the same item of evidence? What about the results from different items? What about case circumstances? Should she be allowed to testify about the totality of the results and conclusions in a case? As the ragout arrived from the kitchen, we began our verbal cogitation of this issue.

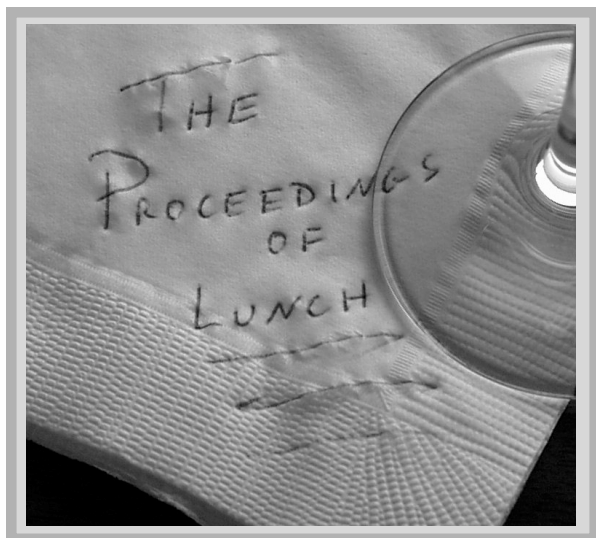
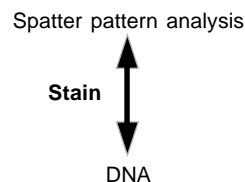
Keith starts the discussion by recalling an electronic list posting by a well known "DNA attorney" in which he adamantly insisted that analysts should refrain from taking information about other evidence into account when providing conclusions. Some criminalists share the view that they should operate in a vacuum, conscientiously providing sterile, untainted results from one type of analysis on a single item of evidence. Norah suggests that it is useful to differentiate between analyses performed on the same item of evidence, analyses performed on different items of evidence, and non-scientific case evidence. Legitimate reasons exist for a forensic scientist to interpret his results in light of other scientific evidence or even case circumstances. In fact, Norah remembers one of her first private cases in which the deliberate refusal of both the prosecutor and laboratory personnel to do so resulted in an

incomplete interpretation of the evidence, if not a miscarriage of justice (Sidebar 1). Keith suggests that good reason may exist to widen the limits of evidence interpretation, but reiterates our ever-present mantra that any assumptions required to reach a particular conclusion must be properly articulated. We decide that some examples would be useful to further the discussion.



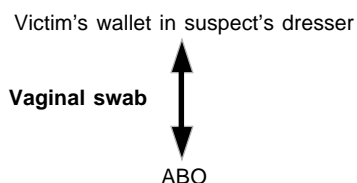
The above examples each involve an item of evidence for which different analyses might answer the question about common source. For the stain and the fiber, one (old and grizzled) analyst could perform both examinations. It would be not only ridiculous to suggest that he could not testify to the combined meaning of the two results, but not to do so could be misleading (Sidebar 1). Similarly, analyzing the fiber using both microscopy and instrumental analysis simply provides additional information of a similar type about a single piece of evidence. It is hard to justify not combining them and most trace analysts would do so without thinking twice. Microscopy and mtDNA analysis provide different kinds of information about a single piece of evidence, visual and genetic. Not only would the examinations likely be performed by different analysts, neither is likely to possess the requisite expertise to competently interpret the results of the other. Nevertheless, it is incumbent upon the laboratory to ascertain, at the very least, that multiple types of analyses performed on the same item of evidence do not lead to different nominal conclusions. For example, it would not be surprising if two hairs concluded to possibly share a common source by microscopic comparison could be differentiated by mtDNA analysis; this apparent discrepancy can and should be explained in a joint report. Conversely, it is possible, but more difficult to explain, that two hairs excluded as possibly originating from a common source by microscopy share the same mtDNA profile. Either way, it is incumbent upon the laboratory to interpret the evidence based on the totality of the analyses. The unattractive option is to leave it to the attorneys, DNA or otherwise.

Keith puts forth the following example, in which not only are two different analyses performed on a single piece of evidence, they answer different questions.



Either “who?” or “how?” might be important, or both, depending on the circumstances of the case. In this instance, the analyses would most likely be performed by different criminalists. Because each analysis addresses a different question, the results are less likely to conflict. Thus, in contrast to the previous examples, a consolidated opinion is not necessarily required. However, it is legitimate for one to be offered and it could be helpful. For instance, interpretation of the spatter pattern may depend on whose blood it is. From a slightly different perspective, the choice of which stains to test for source (or combine for analysis) may depend on interpretation of the spatter pattern. Norah points to the infamous example of the Marilyn Sheppard case in which Dr. Paul Kirk identified “stain A” (Figure 1), likely left by the perpetrator, among a spatter pattern of blood from the victim. Over fifty years later, DNA results from “stain A” showed that, at the very least, it was a mixture of two people.¹

Keith remembers an old case of his in which the results from a piece of scientific evidence and a piece of investigative evidence had to be compared to completely understand the meaning of both.



In this example, which occurred long before we could spell DNA, the initial ABO results indicated an O-secreter semen donor. However, the suspect was an A-secreter, apparently eliminating him as a potential donor. Nevertheless, the detective was unwilling to dismiss said suspect as the rapist for the rather compelling reason that the victim’s wallet was found in the suspect’s dresser. While failing to find the suspect’s ABO type on the vaginal swab did not formally eliminate him as the rapist, the question was left begging as to who the semen donor was. Fortunately, someone thought to ask whether some anomaly might exist to explain the apparent exclusion. Old-time serologists will remember the phenomenon of inverted secretor status, where an individual shows inverted A:H antigen ratios between his saliva and semen. While it is not appropriate to argue, *ad hoc*, that someone might be included simply because of this known rare anomaly, happily the hypothesis can be tested. In this case, saliva and semen samples from the suspect were obtained, tested, and found to possess the rare inverted secretor status. In the suspect’s saliva, the A:H ratio was about 1000:200 titer units, whereas in his semen the ratio was 200:8000. Doing the math shows that, at a semen dilution greater than about 1:200, the suspect’s ABO type A would not be detected. The semen dilution in the evidence was esti-

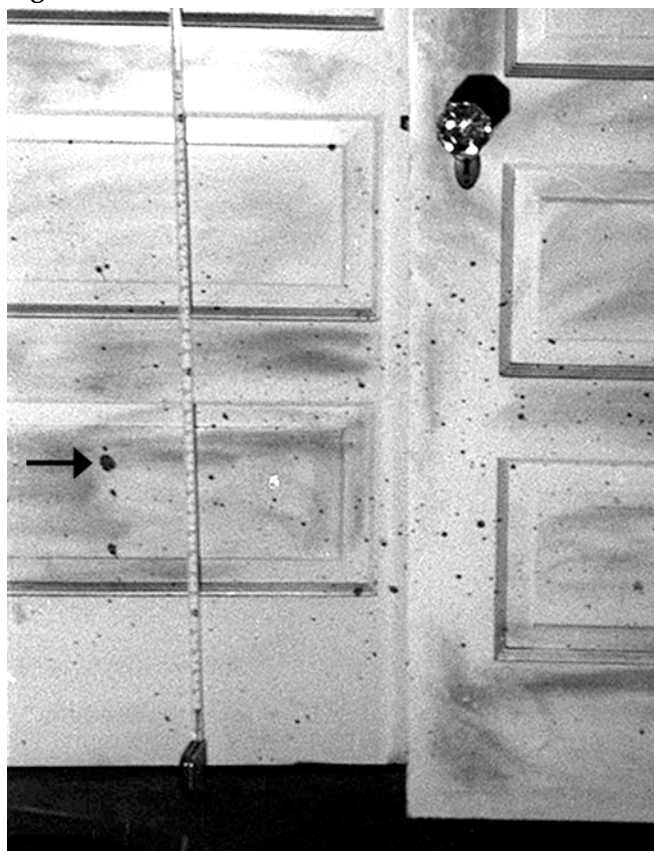
mated at about 1:400. Here, communication of information from the detective to the criminalist about a piece of investigative evidence suggested a new question that was able to be answered by the analysis of physical evidence. While it obviously was not appropriate for the analyst to directly incorporate the information about the wallet into the interpretation of his results (either consciously or sub-consciously), it was appropriate to use this case circumstance to frame a new scientific question about the evidence.

Keith remembers that Stuart Kind has made the point time and again² that the process of evaluating evidence is iterative. Put another way, this means that we must constantly check new facts against old ones to ensure that the hypothesis or conclusion is congruent, containing no mutually exclusive elements; the evidence must “hang together.” Norah suggests that, although we must always guard against even sub-conscious bias, to evaluate a piece physical evidence in a vacuum is to risk not only an incomplete, but a potentially misleading conclusion about the case. We need to find a way in which criminalists can have access to case information and results from other analyses, yet guard against their misuse. This might best be accomplished with a combination of education, training, review, and oversight. But that is a topic for another lunch.

With the repast consumed, all elements blending nicely together, we adjourned the Proceedings for another day. The meal was finished, but we were sure that discussion about this topic would continue.

1. Kirk, Paul, *Affidavit in the matter of Marilyn Sheppard*, 1955.
2. Kind, Stuart, *Crime Investigation and the criminal trial: a three chapter paradigm of evidence*, JFSS 34(3) 1994, pg. 155-164

Figure 1



¹ Kirk had always insisted that this stain was from a different person than the main spatter pattern based on both its visual appearance and ABO typing. Although both a sample apparently from the main spatter pattern and “stain A” both typed as O, he reported that “stain A” took an abnormally long time to react and speculated that this was due to blood component affecting solubility that were different than the other stain.¹

Sidebar 1

	PGM convent	PGM subtype	DQA1	LDLR	GYPA	HGBB	D7S8	GC	D1S80
Victim	1	1+	1.1	B	B	AB	AB	A	26,34
Suspect	NT	2+1+	1.2	AB	A	BC	A	AB	18,24
swab w/ blood inside sink	2-1	2+1+	1.1	B	B	AB	AB	A	26,34
blood crusts top of sink	2-1	2+1+	1.1	B	B	AB	AB	A	26,34
blood crusts kitchen floor	NT	2+1+	1.1	B	B	AB	AB	A	NR

NR – no result, NT – not tested

The victim was found stabbed to death at a very bloody crime scene. The suspect, arrested shortly thereafter, did not have any obvious bleeding wounds. An abbreviated chart of the biological evidence and reference samples tested is shown above. Three bloodstains collected in and around the kitchen sink area were tested for PGM (both conventional and subtyping), and for DNA at 7 loci. At the DNA loci, all three strains showed the same type as the victim. The PGM results showed the same type as the suspect. No evidence of a mixture was seen in either the PGM (unequal band intensities) or DNA results (more than two alleles at a locus or unequal band or dot intensities). Nevertheless, the prosecution team, including both the attorney and the analysts, argued strongly that the evidence resulted from a mixture of the suspect and victim. No further work was performed to attempt to resolve this seemingly odd result.

Poetic License in Firearms Examination Dept.

Why the Lights Went Out on Dan McGrew

"The Shooting of Dan McGrew" by Robert W. Service, 1916, is a famous poem that contains these lines:

"A bunch of boys were whooping it up in the
Malamute Saloon;
The kid that handles the music-box was hitting
a ragtime tune;
Back of the bar in a solo game, sat Dangerous
Dan McGrew,
And watching his luck was his light-o'-love, the
lady that's known as Lou.
Then I ducked my head, and the lights went out,
and two guns blazed in the dark,
And a woman screamed, and the lights went up,
and two men lay stiff and stark.
Pitched on his head, and pumped full of lead,
was Dangerous Dan McGrew."

"Sydney, Neb., newspapers from the 1870s and 1880s include several accounts of shoot-outs in local saloons or ho-

tels. These articles are interesting in their own right, but what stands out are statements that concussion from the gunshots blew out the lamps. After one or two rounds had been fired, the contestants were literally shooting in the dark."

At the time, open flame lamps lit most saloons, hotels, and similar places. Swinging doors were not in general use. In confined spaces like saloons, the concussion from large-caliber, short-barreled handguns simply blew out the lamps.

In their excerpt of this same article, the Chemical and Engineering News (*C&EN*, Nov. 5, 2001) reports that "Potter, a longtime black-powder shooter, was well equipped to try it himself." He actually staged the scene at a muzzle-loading rifle club's clubhouse, 12 x 24 feet and lit by kerosene lamps with glass chimneys.

The shooter loaded a .44-caliber revolver with 35 grains of black powder and a tight fitting ball. He then blasted away through an open window (no need for a new hole in the wall) while 8 feet away from the lamp and again at 12 feet away. The shots, he reports, "snuffed the lamp just as quickly as if I had blown it out myself . . . The concussion inside the room was pretty fierce even with the window open."

Reprinted by permission of the author. Submitted by Bob Blackledge. From an article titled "Shots in the Dark" by James E Potter, appearing in last February's issue of Roundup Magazine, published by Western Writers of America Inc., Franklin, Tenn.

Training and Resources Committee

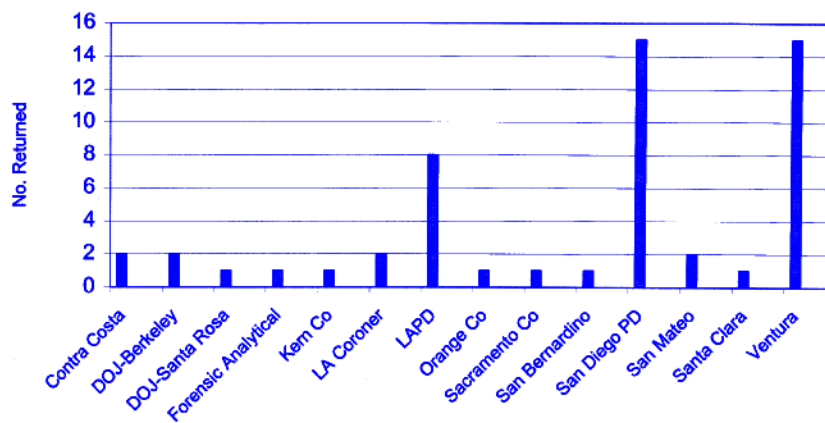
2002-2003 MEMBER SURVEY RESULTS

	1st Choice	2nd	3rd	Total
• General Criminalistics				
Crime Scene I	1			1
Crime Scene II	1			1
Crime Scene (level/type not specified)	5	2	2	9
Crime Scene Processing (level not specified)	1	1		2
Crime Scene Reconstruction	2	3	1	6
Bloodstain Pattern Interpretation (Basic)	3	1	2	6
Bloodstain Pattern Interpretation (Advanced)	1	2	2	5
Bloodstain Pattern Interpretation (level not specified)		3		3
Pathology of Wounds		2	3	5
Photomicrography with John Delly (write-in selection)	1		2	3
• Chemistry				
Controlled Substances	2	1	1	4
Clandestine Labs and/or Refresher	1			1
Toxicology and/or Poison Analysis	1	5	1	7
Drugs/impaired Driving (write-in selection)			1	1
Pharmacology (write-in selection)			1	1
Introduction to Forensic Toxicology (write-in selection)			1	1
Low Level Alcohol Impairment (first time offered)	10	3	4	17
Scanning Electron Microscopy	1			1
Instrumentation/Spectral Interpretation (type not specified)		1	2	3
GCMS	1	1		2
IR		2		2
HPLC		1		1
• Questioned Documents/Computers/Photography				
Machine Printing/Paper & Inks	1			1
Digital Imaging			3	3
VISIO Computerized Crime Scene Program			1	1
• Firearms				
Firearms/Toolmarks (level not specified)	1			1
Assault Weapons	1		1	2
Firearms Trajectory	5	3		8
Firearms Safety	1		1	2
Conversion to Fully Auto Weapons	1	2		3
Firearms Armorer's School		1	2	3
Gunshot Residue (Distance Determination)			1	1
• Forensic Biology				
Advanced STRs	2	1		3
SIRs (level not specified)	1			1
Capillary Electrophoresis		1	2	3
Sexual Assault Evidence	1	2	1	4
Microscopy of Rape Evidence		1	2	3
Molecular Bio/Biochem/Genetics (not specified)		1		1
Forensic Statistics for DNA Analysis			2	2
DNA Case Review for Supervisors			1	1
• Trace				
Arson (level/type not specified)			2	2
Introduction to Arson			1	1

Burn Day/Fire Investigation Seminar (write-in selection)	1		1
Glass		1	1
Paint		1	1
Glass/Paint/Headlamp Exam (not specified)	1		1
Biological Factors in Soil, Pollen and/or Botanical Traces		1	2
Shoeprints/Tiretracks (Exam and/or Collection)	2		2
Microscopy-PLM (level not specified)	2	1	5
Advanced Microscopy-PLM	1		1
Hairs/Fibers	1	1	4
Animal Hairs/Feathers		2	2
Hairs/Fibers and/or Animal Hairs/Feathers (not specified)		1	1
Textile Fundamentals	1	2	3
Building Materials (write-in selection)		1	1
Dyeing & Finishing (write-in selection)	1		1
Cargille Chemistry w/John Delly (write-in selection)		1	1
Gunshot Residue (Hand and/or Other Surfaces)	1	1	2
Scanning Electron Microscopy		1	1
• Other			
Technical Writing	1	2	3
Quality Assurance Practices	1		1
DAB/ASCLD/CODIS Audit Requirements (write-in selection)		1	1
People Skills		1	1
Leadership/Management Training	1		1
Supervisory Skills for Technical Persons		2	3
General Criminalistics Case Review for Supervisors		1	1
Disaster Planning/Emergency Preparedness	1		1
Lab Ventilation or Design/Layout		1	1
Lab Safety	1		1
Clan Lab Safety/Safety Officer (not specified)		1	1
Statistics		1	1
Statistics: Scientific Data Analysis (write-in selection)	2		2
Ethics		2	2
P.C. 832 Equivalent Class (write-in selection)	1		1

2002-2003 T&R Member Survey Responses

(n=53)



B O A R D O F D I R E C T O R S

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Daniel J. Gregonis



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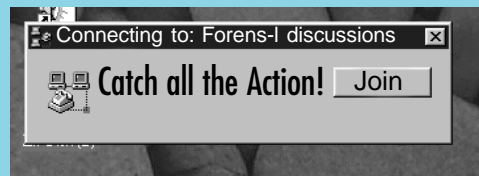


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