

The President's Desk

Sleepless in Seattle

Ibegan my service as CAC President a year ago, soon after the release of the NAS report. I think when the report first came out there was a general feeling of shock and disbelief that this group could take such a negative view of forensic science. Many "news" vehicles grabbed onto this report, including a negative spin with catchy headlines in several articles. As time went on it was recognized that the main message of the NAS Report was the need for more education and standardization across the forensic science disciplines and across the multiple states and municipalities which provide some sort of forensic services.

I attended the AAFS meeting in Seattle this past week, and it was clear that the NAS Report was an issue that forensic scientists were eager to address. The common theme was the need for education. Practicing forensic scientists want more education on new technologies. Judges and lawyers have expressed a need for education regarding the applications of forensic science techniques and terminology, and incoming forensic scientists' need access to educational programs that will provide research opportunities and education on basic forensic science principals. We are fortunate that the CAC has close ties with several forensic science education programs in California, and we must continue to support that connection. These forensic science students are eager to assist with research projects, and we must encourage them by offering suggestions that will assist the practicing scientist with their casework. Another area of education need is in the area of critical thinking skills, both for future and practicing forensic scientists. In these times of increased casework output, we must be able to evaluate the evidence submitted and determine if the proper case questions are being addressed.

Another topic that came up numerous times at the AAFS meeting was certification. The message is that certification will be required in some form. The mechanism to accomplish this is unknown at this time. The CAC has always been a supporter of certification, as we produced the first examinations in 1989. This examination was taken over by the American Board of Criminalistics (ABC). There are more CAC members certified by the ABC than any other regional association. To further demonstrate our support, there are currently two CAC members on the ABC Board of Directors, and another on the Examination Committee. The CAC will reimburse any member's application fee if they choose to sit for an examination. The examinations are given at each CAC seminar. Additionally, an examination sitting can be scheduled at any facility, providing a test site manager is available. Any current or previous ABC Board of Director or Examination Committee member can serve as test site manager. It is a rigorous examination, and it is recommended that, if you plan to take the test, you should study. The currently scheduled examination offerings, study guides and references are available on the website, www.criminalistics.com.

CAC member Laura Silva received the AAFS Regional Forensic Science Award at the 2010 meeting. This prestigious Academy award

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Attendance at seminars not only provides a training venue, but introduces you to our most important resource other forensic scientists...



Mary Hong *CAC President*

SECOND QUARTER 2010

Edito





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

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



On the cover...

The CAC is on the air members caught on the tube sharing their knowledge with millions. (clockwise from top left) Laurie Crutchfield, Steven Dowell, Heidi Robbins and Edwin Jones.

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(l-r) CAC President Mary Hong, Immed. Past Pres. Jennifer Mihalovich, Laura Silva, and Past Pres. Mary Gibbons pose after the AAFS awards ceremony in Seattle. Laura received the Academy's Regional Forensic Science Award.

"Familiar Face" Dick Rogers to Retire

A familiar face at countless CAC seminars, Dick Rogers is finally retiring after decades of introducing new forensic products to several generations of criminalists.

race Evidence Analyst

CAC member Ed Jones describes the finding of unusual trace

titled "All that Glitters is Gold," aired Oct 16 on truTV.

evidence—glitter—in a murder case. The Forensic Files episode,

Rogers, 72, said that he enjoyed meeting with CAC members and supporting seminars since he founded Evipaq in 1990. Evipaq was sold to Armor Forensics in 2002 and Armor itself was recently taken over by Safariland.

Dick, who put 179,000 miles on his car in just the past 3 years, has visited most of the labs on the west coast and could always be counted on to buy a table at seminars hosted by many small professional organizations. Dick says he will be working with Safariland as a consultant for the next year or so but looks forward to some well-earned relaxation at his home in Las Vegas.





Difficult Times & Controversial Issues

don't need to remind you that we are currently living Lin difficult economic times. We all know people who have lost their jobs, lost their homes, and are having a difficult time making ends meet. One of the reasons I sought employment in the public sector was to buffer myself and my family from difficult times such as these. It was generally believed that once you had a government job, you would have it for life. Unfortunately, this time it's different. Though there have not yet been layoffs of public employees in the City of Los Angeles, the possibility strongly exists. It is anticipated Los Angeles will be over \$400 million in the red next fiscal year. The mayor and the City Council have started the process of identifying 4000 civilian positions across city government to eliminate. I don't know if this is all just political posturing or will be a reality, but there is a strong potential people will be laid off if the jobs are eliminated.

The bright side to this disturbing reality is we work in public safety. The primary mandate of our government is to protect the citizenry from both internal and external influences that desire to bring us harm. Because of this, our positions are significantly more secure than other civilian government positions. Unfortunately, being "more" secure in an unsecure world does not mean there is less concern for the stability of our futures and the stress which accompanies that concern.

In a previous editorial about my career choices and the path that has brought me to where I am today, I wrote about embracing our profession as a means to provide job satisfaction when your employer falls short. The work we do provides an invaluable service to society. What we do and how we do it is so important it transcends allegiance to any single employer and requires unwavering allegiance to science. Now, in these tenuous economic times, is a perfect time to focus more on our profession and how we do our jobs. By directing our focus away from both the real and imaginary concerns of difficult times and ensuring the service we provide is of the highest quality, is professional, and unbiased, we convince others that what we do is essential to the functioning of modern society. This does not mean everyone in criminalistics will not feel the

By directing our focus away from both the real and imaginary concerns of difficult times and ensuring the service we provide is of the highest quality, is professional, and unbiased, we convince others that what we do is essential to the functioning of modern society. effects of the economic downturn, but a renewed professional focus will provide job satisfaction that might relieve some of the stress of the times and prepare us for better times in the future.

As I write my editorial, this issue of the *CACNews* has the potential to be shorter than usual. There are no seminar photos or abstracts to print, technical articles have not come flooding into our e-mail in-baskets, there is no new Founder's Lecture to share, and no Most Outstanding Paper Award to publish. That aside, I have full faith and confidence our Newsletter Art Director, John Houde, will fill the pages with interesting tidbits about the activities of our members and our association, plus many other news items of which I have yet to learn. I am going to take advantage of the potentially reduced size of this issue of *CACNews* as an opportunity to provide the readers with a little controversy.

I have included in this *CACNews* issue a reprint of an article that originally appeared in a 2009 Journal of the Institute for the Advancement of Criminal Justice. The article was written by John Collins and Jay Jarvis of the Crime Lab Project and is being reprinted with the approval of Mr. Collins. It is my hope that the reprinted article, along with our usual offering—*The Proceedings of Lunch* (POL) by Keith Inman and Norah Rudin, will challenge you to think about our profession. To consider questions and issues which might not be a normal part of a criminalistics technical discussion, but are equally important in how we present our work product and ourselves to society?

It is my hope that by reprinting the article "Contextual Contamination of Forensic Evidence by Postconviction Litiga-

tors," readers of the *CACNews* will be moved to respond. I am fully aware there are people who do not agree with some of which is written in the article, but it is through differences of opinion and discussion of the difference when ideas are shared.

continues on page eight



Greg Matheson CAC Editorial Secretary

DBACK from our readers

The President's Desk

is offered on a rotating basis to two or three regional associations each year. The award recognizes contributions made to the forensic sciences by younger/newer members of the profession. Laura also presented a paper to the General Section at this meeting. I was pleased to see several other CAC members presenting in Seattle. The CAC has always had a strong national presence, and this was demonstrated by our members who took the extra time to share their research and ideas with the attendees at the AAFS.

The National Science and Technology Council Subcommittee on Forensic Science have organized five interagency working groups (IWG's): Research, Development, Testing, and Evaluation; Standards Practices and Protocols; Education Ethics, and Terminology; Accreditation and Certification; and Outreach and Communication. Seventy percent of these IWGs will be made up of federal employees, with the remaining thirty percent from state and local government. The regional organizations, including the CAC, have been requested to submit nominations for these working groups. The working groups plan to request input from the community through town hall meetings at the regional association meetings and through an as yet to be determined internet based mechanism. I am in the process of submitting nominations and hope that the CAC will have good representation.

As this year as president comes to a close, I would like to encourage members to take advantage of the CAC and become more active. There are many ways the CAC can enhance the profession as a whole and also your personal professional experience. Attendance at seminars not only provides a training venue, but introduces you to our most important resource—other forensic scientists whose expertise can be tapped when you have a question regarding a case, the application and success of new technologies, or general case or laboratory management.

Presentation of research or case studies at seminars allows you to hone your public speaking skills and provides a mechanism for peer review of your work.

An excellent initiation to the operation of the CAC is service on a committee. Several of the committees have taken on new tasks and updated their procedures this past year. The committees and a general description of their duties are available on the website. The committee procedures will be available soon.

I would like to thank Eric Halsing and Mark Traughber for their work on website, it has become a source of up-to-date information and is very easy to navigate.

Finally, at some point in your career, you should consider service on the Board of Directors. During the past six years that I have served on the Board of Directors, we have had a wide variety of experience, representing the composition of the association. This has allowed for a variety of viewpoints to be represented as the board makes decisions affecting the operation of the CAC. Service on the Board of Directors does require work and dedication, but I have found it to be rewarding. I would like to thank, in particular, the members of the BOD this past year, all of whom have been of invaluable assistance. I hope to see many of you at the 2010 Spring Seminar in Yosemite.

Mary

Keep Two Seminars, Keep it Simple

Re:Reducing the number of CAC seminars, [President's Desk, CACNews 1stQ2010] my take is that the seminars have grown in complexity and expense over the years. (I've attended virtually every single one for a decade.) I think our founders would have suggested returning to our roots and dialing down the entertainment and simply creating a comfortable space where members can interact and share technical info. That may mean a hotel at the Oakland and LA airports, a meeting room and maybe a banquet, no lunches, tours, professional entertainers, etc. Let's re-examine the purpose of our seminars and try to reduce the workload on the hosting labs to the point where the commitment becomes less onerous.

Just give me a place to meet and I'll make my own food arrangements. Don't get me wrong, I enjoy a good program, but they take a large up-front expense and require a lot of personnel to plan and execute.

I am opposed to reducing the number of seminars—I think it puts too many people out of the loop for too long. Interest in the group wanes if you have to wait two years for the next seminar to be held in your area. By "interest," I mean presenting papers and teaching workshops.

—John Houde

Soil Web Address Correction

I have been getting e-mails from a number of individuals in reference to conflicting information on the web regarding the dates and location of the 3rd International Conference on Criminal and Environmental Soil Forensics. *Please ignore the information posted at the following website:*

www.soilforensicsinternational.org/sfi2010.php

Please refer to the following website for the correct meeting information: www.acsmeetings.org/

—Marianne Stam Program Coordinator

Grant Proposals Invited

Want to host training at your laboratory but your agency doesn't have the funds? Have an interesting phenomenon you'd like to study but can't afford the reagents? Maybe the Endowment can help! The A. Reed and Virginia McLaughlin Endowment has three areas of funding: training, scholarships and research. The Endowment Committee strongly encourages individuals and/or institutions to apply for funding. Please see the front page of www.cacnews.org for more information and instructions on how to apply.

> —Todd Weller Criminalist Oakland Police Dept.

American Academy of Forensic Sciences—Report from Seattle



The weather didn't deter Californians from attending the AAFS meeting in Seattle last month. Spotted among the 3,000 registered attendees were no fewer than two-dozen CAC members. This "granddaddy" of forensic get-togethers stretched across eight days, offering a smörgåsbord of workshops, roundtables, poster sessions and technical papers.

The controversial NAS report wasn't the only thing being discussed, either. Several CAC members presented papers, including Wayne Moorehead (*above*), who gave a talk on the application of fire debris analysis to toxicological problems.

A popular attraction was an unusual exhibit featuring a NFSTC mobile crime laboratory. Kevin Lothridge (*right*) explained how this collapsible utility can be airlifted anywhere in the world and quickly set-up to provide forensic services in less than hospitable places. (It was covered with camouflage.)

The vendor area was jam-packed with companies showing off the latest forensic applications and high-tech hardware. Computer controlled crime-scene scanners and high intensity UV sources were set up to lure passers-by. Overheard were comments about how the current econo-



Billy Young (above) demonstrates the NamUS system which allows law enforcement to coordinate on-line searches using identifying characteristics of missing persons, with an aim toward giving names to the thousands of unidentified bodies in the US.



Calico Press photos

my had forced many vendors to re-think their attendance at seminars such as this. One fellow said he had to "lobby his boss pretty hard" and insisted that the AAFS show is not to be missed.

An author's table where member's books could be displayed was a popular hangout, especially to thumb through a curious little German book, "Wo Bleibt Die Maus?" which tried to introduce children to the concept of death as a part of life.

Seattle has played host to the AAFS for several years now and organizers were quite complimentary when they mentioned the Seattle Convention Center's accessibility and comfortable facility.



The article focuses on issues surrounding post-conviction acquittals and discusses controversies surrounding the reported cause for the "wrongful convictions," but I feel the more important issues presented in the article which must be considered are:

• Can forensic science prove guilt or innocence?

• Can a forensic scientist feel they can "win" or "lose" a case? What does it say about them and their perspective if they answer this question, yes?

• How is data evaluated and presented? In court, in the media or in publications. Whether it is by forensic scientists, litigators, legislators or any other person or entity with a message to present or an agenda to put forward.

• The level of resources for the delivery of forensic science services and the consequences if it is insufficient.

• The role of forensic science in the administration of justice.

Please share with us your opinions about what is being presented in this issue of the *CACNews*. \land



Soil Abstracts Wanted

The Dirty Evidence: Soil and Geoscientific Contributions to Intelligence Gathering and Environmental and Public Safety, November 2 – 4, 2010

The 3rd International Conference on Criminal and Environmental Soil Forensics is only 9 months away in beautiful Long Beach, California!

Abstract submission information and instructions as well as other conference information will be available at: www.acsmeetings.org/

Please mark your calendars for these important dates:

• Registration will open on July 1, 2010. Information on registration fees and deadline dates will be available in May, 2010.

• The ASA-CSSA-SSSA Housing Bureau will open on July 1, 2010.

Join us in beautiful, family friendly Long Beach, California for 2 ½ days of speakers with sessions covering contributions of forensic soil and forensic geoscience to intelligence work, public safety and the environment.

For more information, contact Marianne Stam at: marianne.stam@doj.ca.gov

A Sampling of Papers at Tenaya

In addition to the array of workshops listed on this page, here are a few of the scheduled technical papers to be presented at the upcoming CAC seminar: —The Steven Tauzer Murder Case: When Tragedy Hits Home

---Methamphetamine Data-Enantiomer Enrichment Processing Trends

—The Effect of Hematrocrit Concentration on Forensic Blood Alcohol Analysis

—The Behavior of Expelled Glass Fragments During Projectile Penetration and Perforation of Glass

-Characterization of Multilayered Glitter Particles

—Forensic Investigation of the Shooting Deaths of Four Oakland Police Officers on 3-21-09

—Comparison of General Rifling Characteristics from Lead Bullet Cores with the General Rifling Characteristics from Bullet Jacketing

—Sex, Lies and Blood Alcohol Levels

---Chemical and Instrumental Tests for Suspected Bullet Impact Sites

—Investigation of an alleged Affair Between a Medical Doctor and a Patient

—An Interesting Zip Gun Case

-And many more!!!

In the Round - A Day Aimed at Firearms Experts

Coming June 8, 2010, the Royal Armouries, Leeds, will host a range of speakers from ACPO, Lancaster University, Forensic Pathways Ltd, University of Lausanne, LGC Forensics, NABIS, FSS, Thames Valley Police and Independent Firearms Consultants. Full details are available on the programme and booking form available at

www.forensic-science-society.org.uk/Education+Confe rences+CPD/Society_Conferences_2010.htm

Special Offer: Diploma in Firearms Examination

If you are considering applying for the Diploma in Firearms Examination in 2011 then why not complete an application form in full and bring it along to the conference to receive 10% off the application fee (subject to approval).

(You must attend the conference to be eligible for this offer.) Diploma Application forms can be obtained via the Society's website

www.forensic-science-society.org.uk/Education+Confe rences+CPD/Society+Diplomas

The Forensic Science Society, Clarke House, 18A Mount Parade, Harrogate. North Yorkshire. HG1 1BX

conference@forensic-science-society.org.uk

California Association of Toxicologists

The CAT annouces their next meeting for May 14-15, 2010 in Sacramento. Featured is a "Sleep and Driving Under the Influence Workshop." The meeting will be held at the Embassy Suites in Old Sacramento, 100 Capitol Mall Sacramento, CA 95814. There is a courtesy shuttle from the airport that runs regularly. The CAT room rate is \$139 for Thursday night and \$129 for Friday night. Type "CAT" in the convention section at www.sacramento.embassysuites.com or go directly by pasting the following into your browser: embassysuites.hilton. com/en/es/groups/personalized/SACESES-CAT-20100513/ index.jhtml or by phone at (916) 326-5000. All reservations must be made by April 22nd to receive these rates.



Tenaya Meeting Workshops

Alcohol Correlation Study

This workshop will evaluate how the amount of alcohol an individual consumes affects their overall behavior and ability to safely operate a motor vehicle. There will also be discussion of the often asked question, "at what alcohol level are all persons impaired to safely operate a motor vehicle?"

Various tasks such as typing, video/board games, and field sobriety tests (directed by experienced police officers) will be conducted to examine such effects as divided attention and judgement. The study will also correlate blood, urine, and breath alcohol levels (utilizing two breath testing instruments). Other factors which may be examined include tolerence, gender, age, and medication.

All participants will have an active role in the workshop and results of the study are to be published in the *CAC News*. Further instructions will be provided to workshop participants.

Uncertainty of Measurement Workshop

Uncertainty and sources of error are becoming increasingly central to forensic analysis in accredited laboratories. This practical hands-on half day workshop is designed to help analysts develop a foundational understanding and comfort with experimental uncertainty and error as it relates to common forensic measurements. Participants will describe experimental uncertainty and error and their connection to all measurements. Using measurement exercises and group work they will learn to identify and rank likely sources of experimental uncertainty and error in practical scenarios. They will be able to assess whether a level of uncertainty is acceptable within a practical scenario. Participants will be oriented in scientifically accepted ways to document experimental uncertainty and error. Suggestions on orally presenting information will be addressed.

3D Laser Scanning of Shooting Scenes and Trajectories Workshop

Some of the topics this workshop will cover include: How scanners work, validation procedures for scanners and their use as trajectory devices, scene scanning approach, accuracy and precision of trajectory measures, scan registration, trajectory representation within scan worlds, and measuring in scans.

The first half of the session will include live fire in a mock scene followed by scanning of the scene and trajectories and will be held at the Sun Mountain Gun Club. The second half of the class will take place in the classroom back at the Tenaya Lodge, and will be comprised of registration of multiple scans together, as well as analysis of the scanned trajectories. The data will be treated up to a point that simulates a preliminary presentation to interested parties. Additionally, actual scanned cases will be presented.

DNA Workshop

This is a full day workshop intended to satisfy the FBI Quality Assurance Continuing Education requirement. The presentations will include various topics including: mixture interpretation, statistics, challenging samples, Y-STR, Mini-Filer, and the CHOP Program.

Friendly Persuasion

Succeeding as an Expert Witness

by Harold A. Feder & Max M. Houck

4th Ed., CRC Press ISBN 9781420051629 2008, 216 pp, \$89.95

Review by Raymond J. Davis

Courtroom testimony is one of the greatest challenges facing forensic experts in their careers. The expert's work is subject to changes in the law impacting the value of their work and its subsequent admissibility at trial. This can cause a sense on anxiety among professionals which is quite understandable. I have heard many experts state, "My job would be perfect if it weren't for courtroom testimony."

Adding to the expert's burden is the requirement to stay current in an ever changing and dynamic field of study. Attorneys trained and skilled in rhetoric often surpass the expert's ability to match wits in the courtroom. The reason for this predicament lies in the fact that the law is primarily about words and not necessarily about science or the search for truth.

Challenges to the adequacy of training, national accreditation, confidence in quality assurance programs, assessment of errors and unbiased interpretation of analytical results pose far greater challenges than the actual work itself. The

once sacrosanct field of fingerprint comparison is under siege as well as firearm & toolmark examination. In fact, every discipline is under fire at some level and experts are compelled to justify their work in court.

Recently, the National Association of Criminal Defense Lawyers has made a recommendation to have all forensic laboratories come under the jurisdiction of an independent federal agency. They argue that this will provide an unbiased approach to the examination and interpretation of physical evidence. A careful review of their document and the requirements of ASCLD/LAB and ISO accredited laboratories shows them already complying with many of the recommendations made by the NACDL.

In addition, the National Academy of Sciences has weighed in with their recommendations placing an even greater burden upon the expert witness. I would not look forward to facing a withering cross examination regarding the recommendations in the NAS report. Another challenge is the opportunity to impart knowledge and information in a venue not often favorable to the expert witness. The courtroom is not a lecture hall or symposium where the expert has the freedom to discuss their work. Anyone who has been called to the bar of justice soon realizes this fact and they find themselves at the mercy of courtroom procedure.

Experts are not allowed to wax philosophical about their work and must explain its value or relevance through a process more familiar to an 'interrogation'. Experts are seldom permitted the luxury of presenting their testimony on their terms. Instead, they are subject to the whims of prosecutors and defense attorneys alike who seldom view their cases from the expert's perspective. The question is: What are experts to do when confronted with these challenges?

Fortunately, a timely publication on courtroom testimony is now available to assist experts through the labyrinth of the courtroom in the criminal justice system. Succeeding as an Expert Witness, Feder and Houck address the issues of providing effective courtroom testimony in a very well written and comprehensible manner. This book is long overdue and credit should be given to the authors for preparing a superb guide to lead the expert witness through the trials and tribulations of courtroom testimony.

If there is a limitation to this book it may lie in the nature of, 'how to testify as a confident and competent witness'. I don't believe it was the author's intent to discuss that topic preferring to leave it for classroom instruction and moot court training. Hands on training supported by the information contained within Feder and Houck's book will, in my view level the playing field for the expert witness.



A brief overview of the book is provided here:

Chapter one gives a basic overview of the criminal justice process and will be an invaluable read for the beginner.

Chapter two provides a discourse on accreditation, methodology, science and testing.

Chapter three discusses the structure of the criminal justice system and the roles of the participants. Particularly, the role of the expert witness. I would have appreciated knowing this information prior to my first time in the courtroom. There is an important section on the "Ability to Persuade" that should be read often.



Chapter four covers the legal procedures relevant to the expert witness. A discussion on the rules of evidence is a fundamental element of this book and a must read to everyone testifying to their work. Expert testimony has to work within the frame work of the law not within the exchange of scientific information.

Chapter five discusses preparation for trial, the pretrial conference, courtroom dress and demeanor.

Chapter six covers the mechanisms of direct examination with helpful hints and courtroom rules. They stress the ability to present technical and complex ideas in a relaxed, comfortable manner as being a skill that will tip the scales in favor of the expert witness.

Chapter seven covers the use of visual and demonstrative evidence and its effective use in the courtroom. The authors recommend that some thought should be given to the use of visual aids before trial that will support and emphasize the testimony.

Chapter eight covers cross examination. The authors have taken great lengths to provide information to assist the expert witness through this trying part of the testimony. The authors speak about the hypothetical question and one of the challenges faced by experts is that the answer is often framed within the question. These questions can trap the unsuspecting witness and the authors caution to be sure to know all the facts before proffering an answer.

Chapter nine covers ethics. I was pleased to see this topic incorporated in the book. A strong understanding of professionalism and ethics is essential for the successful expert witness. Some of the information provided has issues of morality included. Ethics has nothing to do with a value system of good versus bad. There continues to be confusion between these two concepts. When asked, "Are you an ethical person?" Most people's response is based upon whether they consider themselves good people. Their answer, "Yes, I wouldn't do anything illegal." A better answer would be from knowing the ethical guidelines of my profession and I answer the question, "Yes, I would not violate the guidelines set forth in my code of ethics."

Nonetheless, this is an invaluable treatise on the subject. In addition to the examples in the book, I would also recommend readers to seek out the California Association of Criminalists Code of Ethics which was first proposed in 1953 and has served as a model for other law enforcement agencies and associations.

There are several appendices covering, 'Federal Rules of Evidence', pertinent case law regarding admissibility of evidence, 'A proposed Code of Conduct', and a delightful read, 'An Expert's Bill of Rights' and finally, a section on, 'Glossary and Important Terms'.

No book on expert testimony will be the perfect reference, but "Succeeding" comes as close to anything I have ever read in one book during my career. Again, this book should be an essential part of every forensic expert's personal library. I appreciate the work initially begun by Harold Feder and advanced by Max Houck to assist experts to be more successful on the witness stand.

Raymond J. Davis is the president of CourtSkills and has been teaching the Courtroom Presentation of Evidence course since 1991.

CAC Merchandise?



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2010 Microscopy Course Schedule

McCrone Research Institute a not-for-profit corporation 2820 S. Michigan Avenue, Chicago, Illinois 60616-3230 phone: 312-842-7100 · fax: 312-842-1078 · www.mcri.org

FORENSIC AND TRACE EVIDENCE COURSES

Applied Polarized Light Microscopy (1201) / Forensic Microscopy(1204) February 22–26; March 29–April 2; June 14–18 ; August 23–27; October 4–8; November 29– December 3

Microscopy of Hair & Fibers (1207) November 1–5

Advanced Applied Polarized Light Microscopy (1251*) /Advanced Forensic Microscopy (1701*) August 30–September 3

Microscopy of Soils (1710) October 25–29

Microscopy of Explosives (1722*) October 18–22

NIJ FORENSIC MICROSCOPY COURSES

Through a grant funded by the National Institute of Justice, McCrone Research Institute now offers FREE Forensic Microscopy Training Courses to eligible forensic scientists from state and local crime laboratories.

For more information, please visit www.dna.gov/training, or www.mcri.org.

METHODS COURSES

Fluorescence Microscopy (1210) June 28–30

Microchemical Methods (1270A*) June 7–11

Scanning Electron Microscopy and X-Ray Microanalysis (1402) May 17–21; December 6–10

Practical Infrared Microspectroscopy – FTIR(1422) May 24–28 ; August 16–20; December 13–17

Raman Microscopy (1430) June 22–24

Sample Preparation & Manipulation for Microanalysis (1501E) February 15–19

SPECIALTY COURSES

Chemical Microscopy (1202) (at Cornell University) August 2–6

Pharmaceutical Microscopy (1203) June 21–25; September 27–October 1

Microscope Cleaning, Maintenance, and Adjustment (1301) January 7–8; March 8–9; June 14–15

Pollen and Spore Identification (1537) April 5–9

Food and Foreign Body Identification (1560) August 9-13

ENVIRONMENTAL COURSES

Microscopical Identification of Asbestos (1608A) January 11–15; March 15–19; April 26-30; July 26–30; September 13–17; November 8–12

Advanced Asbestos Identification (1608B‡) January 18-22; May 3-7; November 15-19

Asbestos Fiber Counting (NIOSH 582) (1616) January 25–29; March 22-26 September 20–24

Indoor Air Quality: Fungal Spore Identification (1630) April 12–16; August 2–6

Advanced Indoor Air Quality: Fungal Spore Identification (1631+) November 9–11

'ON YOUR SITE' COURSES

Custom design a one-week intensive course that we will hold *at your facility* with an McRI instructor. We bring all materials and equipment for up to 18 students to your site. Each course offers a strong foundation in both theory and application.

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Together, We Save Lives."

In 1922, a scientific approach to criminal investigation was mostly a dream, but in this story, a clever and resourceful officer showed once again how the most important "lab instrument" is between one's ears. Excerpted from from her book "Mounted Justice," we get a glimpse into the formative years of the Pennsylvania State Police through an entertaining and true story by activist Katherine Mayo. (This article was suggested by Bob Blackledge.)

The Patent-Leather Shoes

A nenormous blue-black sky, full of sharp, shimmering stars, contained the ethereal earth. The cloud-like banks of the Alleghenies, faint with new-fallen snow, rolled on and away forever in pearly heights and shadows. Their very forest tracts, overlaid with a fleecy mantle, merged into the even pallor of their waves. Silence and peace transfused an immaculate world. And cold— clear, bitter cold.

Up in the western centre of Pennsylvania, where hills rise high and snow falls heaviest, the tiny farming village of Herman lay like a fairy-land town, each roof and fence and rosebush crowned with its mound of white. And because it was almost midnight and quiet beyond all telling, the place was sound asleep.

sparts Google

One man there was, however, who had been on a journey, and who now, at this untimely hour, was breaking toward the end of his homeward path. Till his coming, not a creature had set foot abroad since the snow had ceased. Hill, plain, and highway, the place lay trackless as the flowing air. With joy he discerned his first familiar landmark, and as he reached that last rise that lifts the road into the village, he stopped to draw breath and to look about him, glad.

How still— how white—how still! Slowly he made out the roof-trees scattered hither and yon below, among the ghost-pale fields, and was half-aware of a sort of awe, a sudden loneliness. As though all his friends were dead—long dead—as though even their day and time had passed away, and left no mark.

No sign of life, no spark of light. The pall of snow, smooth, faintly glittering under the stars, held the world to itself. How still! How pale!

And then, as he looked, his hushed heart gave a sudden leap and all his man's wits sprang alert within him. For there, around the side of one half-buried cottage, came licking a tongue of orange flame. He could not be mistaken!

No! See it there, flaring again— one sinister flash of color, sole in all this spectral world. That must be Ellen Bower's little home. Poor lone woman, with her young daughter and the six little children, all sound asleep, of course, in the rooms above! They would be burned in their beds!

The traveller flung himself forward, plunging heavily across the drifted fields.

"Fire! Fire!" he shouted, making a trumpet of his two hands. "Fire!"— and his voice tore through the night Like the slash of a sword though flesh.

Windows flew up, then down with a bang, as neighbors, wakened by honor echoing though their dreams, saw the danger and sped to help. One lone woman, a girl, six little children, perhaps asleep in their beds, and their cottage in flames! The thought drove the men on. Each snatching a pail or a blanket, they rushed the ditches and fences, ploughed through the drifts, and jumped into work as they found it, with all the speed and strength in their power.

Valiantly toiling, by rapid play together they prevailed at last to control the blaze. To their heartfelt relief it was over before any great harm had been done.

Then, having quenched the last ember, they returned to their several homes in well-earned peace of mind to finish their broken night's sleep.

But Ellen Bower could not finish her sleep—did not want to finish it, for the reason that she and hers had been close to death, that her mind was full of chilling fear, and her head of common sense.

"So it's come at last!" she muttered, as she turned from watching the last good, charcoal-smudged neighbor go his way. "So it's really come at last! Well —now's the time, then! This very instant! Now! Thank God, there'll be nobody stirring yet for hours!"

She was a big woman, Ellen Bower— tall, and heavily built. But her hands shook as she pulled on her rubber boots and snatched her shawl from its peg, and her heart was hammering with more than physical exertion as she hurried out and away to the nearest trusty telephone.

"State Police!" she responded, to Central's sleepy "What number?"

"State Police," clear and alert, a man's voice rang back over the wire.



Katherine Mayo was instrumental in the formation of the New York State Police through her influential writings. One of her books about the history of the Pennsylvania State Police became almost a "model textbook" and was presented to the NY state legislature by none other than Teddy Roosevelt. Shortly thereafter, the NY lawmakers passed needed legislation forming their own state police.

• • •

"In 1913, a construction foreman named Sam Howell was murdered during a payroll robbery in Westchester County. Because Westchester County was a very rural area then, there was no local police department and Mr. Howell's murderers escaped, even though he identified them before he died.

"This vicious crime spurred Mr. Howell's employer, Moyca Newell and her friend, Katherine Mayo (above), to initiate a movement to form a State Police department to provide police protection to rural areas.

"As a result of their efforts, the State Legislature established the New York State Police as a full service police agency on April 11, 1917.

"Since the first 237 men rode out of their training camp on horseback to begin patrolling rural areas, troopers have been there to fulfill the law enforcement needs of the people of New York State with the highest degree of fairness, professionalism and integrity."

Source: www.troopers.state.ny.us/Introduction/History/

The Patent-Leather Shoes

"I am Mrs. Bower," she panted. "I live in Herman. My house has just been a-fire. It's out

But the house all but burned up. I think it was set on purpose. And I think I know who did it. I wish a trooper could come straight over to see me *now.*"

"All right, Mrs. Bower. You're about seven miles away from us. We'll get there just as soon as we can make it."

"You'll know my place without asking, because it's on the skirts of the town as you come— and because it's nigh sure to be the only one with a light Oh, hurry all you can!"

Then she ran home to wait—till two soldierly young figures in the uniform of the State rode up to the gate—Corporal Richard Fairservice and Private Belts. And Corporal Fairservice, late Sergeant of the Fifteenth United States Cavalry, honorably discharged, "character excellent," is the sort of a man that most people trust on sight Ellen Bower, guided by a pertinent question or two, without hesitation laid all before him.

Her young daughter, she said, had been annoyed by the attentions of a worthless fellow whose people lived in the immediate vicinity. The man was a barroom porter in a neighboring town, vicious, ignorant, and with far too much money to spend for any proper explaining. The girl disliked him, and she, the mother, resented his intrusion.

"I am a poor woman," she broke out, in the midst of her tale, "but we are decent, honest people, and my girl is an honest girl, and I won't have her name besmirched with such company. So I ordered him to stay away and to leave my daughter alone. And she herself refused to speak to him.

"Then he was mad. And many's the time we've had notes from him, stuck under the door, or tied to a stone and thrown over the fence, saying he'd make us regret it. And several times he's met one or another of my little children outside, and sent the child home crying, with the message that he'd 'fix' us all, some day.

"So now, when this thing happened, when we were snatched out of our beds to-night with smoke and flames around us, I said to myself:

"'It's come at last. This is McDonald's work. Now I'll go to the State Police.'

"But I didn't say one word to the neighbors, for fear he should get wind and run. I had sense enough for that. And because, too, I wanted 'em all to clear out quick, just as soon as ever the fire was killed, so they shouldn't muss up the trail for you Troopers.

"There! I've done all I can. I believe McDonald set the fire, out of his grudge against me. This time he failed. But how can I live with fear hanging over my head? I can't look to my neighbors for help. This is such a weak little place. And who wants the ill-will of a rogue? I don't mind work and common hardship. I can stand a heap of that, for the children's sake. But this fear for them, day and night, will be killing me. *Lads, I have no big boys of my own—will you boys help me?*"

Stalwart as she was, her lips twitched as she spoke, and the hard-wrung tears stood in her honest eyes.

"We'll do our very best," said Corporal Fair-service. "And thank you kindly for letting us get here before the trail was cold. That's worth everything— everything. Come on outside, Beltz, we'll set to work."

A rapid investigation made clear the incendiary nature of the fire. A part of the outer rear wall of the cottage, and the floor of the porch as well, had been soaked with coal oil. And this enclosed porch contained, as is common in the region, the only stairway leading to the sleeping-rooms above. Had the fire once gained access to the stairway, the widow and her children would have had no chance whatever to escape. None at all.

"Here's the can he brought the oil in!" exclaimed Private Beltz, holding aloft an object that he had just pulled out from under a snow-veiled bush.

"And here's his track, to the best of my present belief. Take the can and come along." Corporal Fairservice passed down the back of the garden as he spoke, his flashlight turned on the snow. "There's only this one trail from the rear, and it's not the natural road for any of the neighbors going home from the fire. Yes, here it runs, out through the back garden gate. But what little prints! Come along. We've got to see this through."

Walking on either side of the track— a single line of man's footsteps— clear in the virgin snow as ink on the printed page, and very small— the Troopers followed it away, over farming land and fences, through brush and brier and ditches, for three good miles and more. Then it led to heavy woods.

Into that faintly fragrant darkness, the two still traced their man, one on either hand. Here, also, bright crystal covered everything, making each withered fern-stalk, each laurel bush, each shrub and vine and creeper, a wand or tent or wreath of shining fleece. The great boughs spreading overhead bore such wide canopies of snow that they shut away

There in the first chamber, under the comforters of a broad, old-fashioned bed, someone lay huddled down, apparently deep in slumber. The Corporal, turning his flashlight full on the face, recognized his man. But that sleep proved strangely persistent. The eyelids, quivering under the strong white ray, remained fast shut.

the stars, and the rays of the Troopers' searchlights seemed to reveal, in their little spheres, a frost king's ebony pillared cave, vaulted with glittering white. Once and again a branch creaked or a bough came crashing down, with the weight of the snow upon it. But otherwise the place was as still as the ever-vocal woods can be.

It was evident, now, that the maker of the trail had deliberately tried to confuse it Here he had jumped from tree to tree, and from tree to tree again, in the endeavor to break and multiply the track. In and out he had wound, and then run back again, describing a maze of loops and overlapping tangles. Patiently, rapidly, the searchers followed on, unwinding a mile of labyrinth, to find themselves in the end on the farther side of the woodland.

Here the trace shot straight ahead for a considerable distance, then sharply returned on itself partway, shot forward again, and again returned as before. Thrice was the manoeuvre repeated. The third time, the line struck finally off in a new direction. One on either side of the footprints, always, the Troopers traced this fresh departure for a full mile, when it led to a farmhouse, completely around it, and so in a circle around the barn. At that point the recent passage of a horse and sleigh had effaced the mark. Briefly the hunters scouted at loss. Then, farther down the road, they picked it up again, where it left the highway and broke across the fields— in a straightaway course to the McDonald house.

It was in the midst of the wee hours now. The house lay dark and still. Corporal Fairservice rapped on the door with the firm and measured rap of sure authority.

In a moment a window above stairs creaked.

"Who's there?" a gruff man's voice called down.

"Officers of the State Police. We want to come in. To see Mr. Ed McDonald."

"Well, Ed McDonald ain't here, and you ain't comin' in, either." The voice swelled with defiant bluster.

"If you don't let us in at once," Corpora Fair-service quietly replied, "I shall break this door."

Suddenly changing tone, the other began a protest "Don't do it! Don't break it!" he cried. "I'll come right down. I'll open the door."

Which he forthwith did, candle in hand.

"Where is Ed McDonald?" the Corporal demanded of the disheveled figure shivering in the entrance hall.

Now, every member of the McDonald family lived in the shadow of a dubious fame, and the attitude natural to all of them, before the law, was that of mingled hostility and fear.

"Ed ain't home," the barelegged one made answer, sullenly.

"That," said the Corporal, "is not true." And, regardless of the other's noisy disclaimers, ran up the stairs.

There in the first chamber, under the comforters of a broad, old-fashioned bed, someone lay huddled down, apparently deep in slumber. The Corporal, turning his flashlight full on the face, recognized his man. But that sleep proved strangely persistent. The eyelids, quivering under the strong white ray, remained fast shut.

The Corporal swung his light around the room—the usual minor farmhouse chamber in all respects but one: it seemed to contain a quite unusual quantity of clothing.

And the garments, instead of reposing in closets and drawers, paraded about as if their owner kept a sort of shop there. Here hung a pair of purple trousers, capped by their waistcoat. Next, the purple coat, extended on a hanger, as though to make the most of it. After that, a gay plaid mackinaw jacket; a black suit; two gaudy waistcoats; a watch and some jewelery, ranged along the bureau-top; a string of brilliant neckties; and so on through a considerable wardrobe.

"What's the meaning of this?" thought the Corporal. He glanced at each several garment— each piece of jewelery— more particularly at the watch.

Then his eyes fell on a chair near the bed. Over its back hung a lilac shirt, evidently taken off that night; and on the floor by its side stood a pair of small and brand-new patent leather shoes.

The Corporal, picking up the shoes, scrutinized them well.

"Incidentally," he thought, "this little chap's a dude." Then he laid his hand on the sleeper's shoulders and gave him a bit of a shake.

"Get up!" he said. "I want to talk to you."

The 'possum opened his eyes, slowly, vaguely, as if emerging from the deeps. He yawned, stretched, then concentrated his cloudy gaze in a long, puzzled frown, as if to question the reality of the figure standing over him. "Come," said the Corporal, "that will do. Dress yourself."

"Why the hell should I? Who are you?"

"You know this uniform, Ed McDonald. Move!"

Grumbling petulantly, the 'possum assumed raiment, and so shuffled before his visitor, even as that visitor suggested, down the stairs.

In the sitting-room, where the air-tight stove glowed red, someone had lighted the lamp. Before the stove stood the man who had disputed the Trooper's entrance, half-clothed, unbrushed, and glumly bristling. By the stove, on haircloth rocking chairs, huddled two sour-visaged women, yellow skinned and shrew-marked, their heads spurred with curl-papers unashamed. By the door, aloof and entirely non-committal, correct as a regular on parade, stood Private Beltz.

To this group entered Corporal Fairservice, preceded by his reluctant friend.

"Sit down," said the Corporal.

The 'possum sat down.

Said the Corporal, after a swift, appraising survey of the audience:

"Tonight an attempt has been made to burn the Bower house, over in Herman Village. Ed McDonald, I think you set that fire."

"I did not! It's a lie!" affronted Innocence declaimed, while all the household joined, indignant, virtuous.

"How did you spend this last afternoon and evening?"

Minutely, volubly, McDonald detailed his afternoon. "And then," he finished, "right after supper— it was snowin' hard still but I put on my big boots, and I didn't care, I wanted company — I went over to the neighbors, over yonder, and passed the evening visiting, and then I turned around and came straight home to bed."

"So there!" a triumphant feminine chorus.

Corporal Fairservice, during the recital, had been standing in the doorway with his hands behind his back. Now he brought his right hand forward, dangling the patent-leather shoes.

"Whose are these?" he asked.

"Don't know. Never saw 'em before," McDonald affirmed.

"I got them in your bedroom. Whose are they?"

"Oh I remember now. They belong to someone who was staying here and who went away quite a while ago."

"These shoes," said the Corporal, "have been worn tonight. Inside and out they are wet with snow-water."

"Can't help it," the 'possum nonchalantly tossed back. "They ain't none o'mine. And I had my rubber boots on when I went out to-night"

"Sh'd think *any* fool 'd know no man 'd ever wear things like that— let alone in winter weather!" snapped one of the ladies by the stove. "Them's my boots. Our visitor give 'em to me. I wore 'em out when I went to feed the hens tonight"

The Corporal was looking at her curiously as she spoke. "Madam," said he, as she finished, "will you do me the favor just to slip this shoe on?"

His manner was faultless, and no one could say that he smiled.

The woman glowered. But this was no time to refuse. Trooper Beltz stood over her with the shoe.

She snatched it out of his hand. She kicked off her heavy slipper. With a do-or-die expression on her face, she thrust her toes into the thing and began to tug. Short of the sacrifice of

The Patent-Leather Shoes

Cinderella's step-sister, nothing could persuade that shoe to admit that foot.

The Corporal turned with urbane seriousness to the other curl-papers. "Madam, your foot, I see, is small. I am sure *you* can put it on."

Half-mollified, half-afraid, the woman made the attempt. But the shoe, size five-and-a-half, stuck promptly. Obviously enough, no condition of wetness or dryness could have changed the result in either case. The shoe was numbers too small.

"Now, Mr. McDonald, will you try this?"

"What do you take me for? A girl? I can't get those things on!"

"Why, then just let me see if I can do it for you.

I never was a shoe clerk, but sooner or later we Troopers have to turn our hand to lots of things." The Corporal, most affable, knelt before the seated man. As he did so, Private Beltz moved quietly over and stood behind him. In The Force they do not offer unnecessary advantage.

The little patent-leather shoes slid over Mc-Donald's feet with only such slight sticking as their soaked condition and the man's original vanity explained. The Trooper laid the buttonhole flaps in place. They met the buttons easily.

"McDonald," he said, rising, "you are under arrest Mr. Beltz, you will hold this man here while I look about outside."

Five minutes later, Fairservice reappeared in the sittingroom door. "Come!" he summoned the prisoner. "And, Beltz, *bring that oil-can, too.*"

In the fresh snow on the porch, and again along the walk between the steps and the road, the line of footprints stood out clearly. And the little patent-leather shoes fitted them to a hair's breadth. But all led into the house.

"These," said the Corporal, "are the tracks that brought us here."

"Yes," agreed Belts, "and from here *to* the neighbor's there should be no tracks. According to the story we've just heard, the snow would have covered 'em."

Nor were any outgoing footprints visible.

Escorting their prisoner between them, the two Troopers tramped off toward the house of that neighbor with whom, as McDonald asserted, he had passed the evening before. More and more sulkily the little man waded the starlit, untrodden fields until, as they reached the neighbor's door, he achieved an obstinate speechlessness.

At the first announcement of the identity of the callers, the neighbor came hastening down to give admittance.

"Come right in, gentlemen! What's the news? What, you, too, McDonald? Why, what brings you out this time o' night? Come right into the kitchen where it's warm." And then, raising his voice, to reach upstairs —"Hurry, wife, hurry down! Let's get the news. Here's State Troopers come to see us."

The good woman descended promptly, hastily clad in a wrapper, huddled in a shawl, bringing her little girl with her. Visibly this extraordinary event touched the whole family with a lively and cheerful interest Far be it from them to wish ill to anyone; but when adventure came of its own accord, why, then, praise be to the chance that granted first view of it!

"I want to ask you, sir, whether Mr. Ed Mc-Donald was here in your house last evening," the Corporal asked, his inflection bare of leading.

"Why, yes," said the householder. "He was here. He came and set awhile and then he left, about bedtime— just after it stopped snowing."

"That would be about what hour?"

"Oh, 'long about eight or quarter after."

"Can you recall how he was dressed?"

"Why —let's see." The farmer pondered a moment, then gave an account of his late visitor's costume that corresponded essentially with McDonald's own statement.

"Do you remember what he wore on his feet?"

The farmer hesitated, but his wife helped him out with quick decision:

"He had on a pair of black, shiny shoes."

"Yes, yes! That's right I reck'lect now," the husband agreed.

"No!" exclaimed McDonald, jarred out of his silence by sudden alarm. "No! You've forgot I had my rubber boots on, didn't I?"

"You did *not*, Ed!" affirmed the wife, unshaken. "You had on a pair of patent-leather shoes, and they were new."

Then up spoke the little girl, big-eyed and breathless with the whole strange event, and with the excitement of bearing testimony. "Yes," she piped, "awful new they were. Awful new and bright and shiny. I was lookin' at 'em all the time. And they squeaked so funny whenever you walked across the floor!"

"Like these?" the Corporal asked, producing his treasures.

"Just like them, *exactly*," cried the family in chorus.

The Corporal looked at McDonald critically. McDonald, speechless again, stared at his rubber toes. But unyielding defiance stood out all over him.

"We thank you very much for your courtesy, and we're sorry we had to disturb you. Good-night!" said the Corporal.

Once again in the arctic open, and with the friendly night, their ally, still keeping folk abed, it was only a matter of steady persistence to do the rest

"No!" exclaimed McDonald, jarred out of his silence by sudden alarm. "No! You've forgot I had my rubber boots on, didn't I?"

"You did not, Ed!" affirmed the wife, unshaken. "You had on a pair

of patent-leather shoes, and they were new."

"Here, dear one," observed Private Belts to the 'possum, "is where we first strike your outward-bound course. Haven't you the cutest little paddy-paws, though!"

Clear still and unconfused, the trail of the patent-leather shoes led away from this house across the fair snow till it reached the intersection of two roads, one of which made toward the village of Herman. This road it followed— followed for some five hundred yards. Then, switching off to the left, it jumped the ditch, wallowed up the bank, and stopped flush against the hither side of a fence.

"See where he stepped up on the rail? See where he leaned across and knocked the snow off the tops of these bushes? Just let me have a look!" cried the Corporal.

He himself was hanging over the fence, now, searching the ground with his pocket light.

"Here it is!" he proclaimed triumphantly. "Take a look, Belts," and he straightened up to turn an eye on the prisoner.

Close under the lee of the fence, sharp-edged in the lesser snow, a round firm hole appeared.

"Ah-ha!" exclaimed Belts. Then over he swung and carefully lowered into that hole his precious oilcan. It fitted precisely.

"So *that* is what I've been toting you for all night, you dirty little beast!" he mused, regarding the can with unfeigned affection. "You remember, Corporal, there's an oil-well just in there, behind those trees? I reckon our Mend filled little Maudie right at that very well, and left her here convenient, some days ago. Didn't you, darling?"

But the 'possum held his peace.

Once more the Troopers resumed the trail, which still persisted toward the town. Occasionally it showed that the traveller had stopped; and then, always beside the prints of stamping feet, stood the clear impression of the can.

McDonald had worn no gloves that frigid night. The tin bail must almost have frozen his hands. His stops would have been to set the can down and beat life into his stiffened fingers.

And each time that the circle appeared, Trooper Belts conscientiously placed his can within it. "Just to be able to say we bore you out," he explained to his friend the prisoner.

"This, too," the Corporal would add, as, producing a shoe, he dropped it into a companion footprint

Presently, now, the track struck off to the railroad bed, thenceforward pursuing the steel to the very skirt of the village. But there, where the rails run under a viaduct, the footsteps veered again, to mount the bridge. On the summit their maker had stopped once more, setting his burden down beside him.

"What a complete little beau you are, McDonald! When you go out to call on the ladies you simply have to dress up in your best, don't you! Purple boiled shirt and shiny shoes and all — even when the weather's at zero and the snow three feet deep—even when your mission to the ladies is to burn them alive in their beds. —*What* a little beau you are!"

"See!" said the Corporal. "There is the Bower cottage, right down there below. You could throw a stone from this very spot and hit it. And you climbed up here— didn't you, McDonald — just to get a good look around — to see if everyone had gone to bed — to see if anyone was on the road at that hour. And there wasn't. So, after you'd warmed your hands and feet again, you picked up your can —this very can— and you came along, just as we'll go now — always following your footprints." Those footprints led to a point some hundred yards above the widow's cottage. Then they turned, entered the little garden and were lost among the tramplings of the fire fighters.

The case came up for trial in the December term of Court. In the interval Corporal Fairservice, haying duly completed its preparation, did a little quiet investigating of the career of Edward McDonald during the previous year. This investigation proved the man's guilt in a wide range of petty offences, including the theft of the very watch that the Corporal had noticed displayed on his bureau at home.

At his trial for felonious arson, however, McDonald continued to assert innocence, and from some obscure source was supplied with ample means to prolong the fight. It was toward the end of a four-day struggle that counsel for the defense saw fit to make use of the patent-leather shoes.

"My client," said he, "is threatened with conviction by a pair of shoes—those very shoes on the table before you, gentlemen of the jury—shoes of a type made by the hundreds of thousands and distributed around the globe! It has been assumed that the man who wore those shoes set the house afire. Very well, let it be so. *I affirm that those shoes fit the foot of Corporal Fairservice of the State Police.*"

The court-room caught its breath, sat up suddenly and stared. What could this mean?

The counsel for the defense surveyed his effect. Now he concluded, with smooth insinuation in his smile:

"I suppose that the officer of the State Police can have no objection to trying on the shoes?"

"Certainly I will try them," replied the officer questioned.

Corporal Fairservice is six feet tall, broad and well-proportioned. In the sight of Court and jury, he unstrapped his high uniform puttee, pulled off his heavy boot, and thrust his foot into the little patent-leather gimcrack. It slid on easily.

Counsel for the defense looked about in triumph. This was magnificent He braced himself for a fight.

But the Corporal was whispering to the District Attorney. Now he put his foot on a chair.

"May I ask," said the District Attorney, aloud, "if the counsel for the defense will kindly do us the favor to step over and fasten this shoe?"

A little warily, his opponent drew near—looked at the raised foot and the boot upon it—ventured to touch it, to draw buttonholes and buttons together.

The lap refused to cover the Corporal's instep by a good bit more than an inch.

"No flat-feet on our State Force, sir," observed the District Attorney, cheerfully.

The Court sentenced Edward McDonald, found guilty in manner and form as indicted, to a term of not less than three, and not more than seven years in the Western Penitentiary. While he stays there, Ellen Bower and her little family will sleep of nights in peace.

Recorder's Note: The only departures from fact in this narrative are in the names "Bower" and "Donald," which are substitutes.



We argue, however, that the intense activism surrounding postconviction litigation introduces a potentially catastrophic form of contamination to postconviction proceedings. We refer to this phenomenon as "contextual contamination," which is the misapplication of circumstantial information during the legal and judicial interpretation of scientific findings. Because DNA exonerations, as they are commonly called, often occur long after the original crimes were committed, newly acquired scientific findings, however accurate or valid they may be, can be improperly applied by litigators and judges who fail to consider the full significance and probative value of the forensic evidence.

From the perspective of the forensic science community, contextual contamination has also caused a serious problem outside of the courtroom. An energetic and persistent public policy campaign has been fueled by postconviction litigation activists who blame faulty forensic science for being a leading cause of wrongful convictions. In this article, we provide a historical background for this campaign and demonstrate through actual case studies how serious the threat of contextual contamination is to the American criminal justice system and the safety of the public.

Authors' Note

The conclusions and opinions expressed in this paper are solely those of the authors and do not necessarily reflect

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Contextual Contamination of Forensic Evidence by Postconviction Litigators

by John M. Collins & Jay Jarvis

An energetic and persistent public policy campaign has been fueled by postconviction litigation activists who blame faulty forensic science for being a leading cause of wrongful convictions. the views of any persons or organizations with whom the authors are affiliated or employed. We also wish to emphasize that we have no official opinion regarding the guilt or innocence of any individuals discussed in this paper. Readers are strongly encouraged to draw their own conclusions about a case only after they have independently researched all of the available information. The facts surrounding criminal cases such as the ones discussed here are complex and may not be entirely accessible to the public.

1989–2009: Twenty Turbulent Years

The year 2009 marked the end of what was possibly one of the most fascinating and compelling periods in the history of American criminal justice. It began 20 years ago on January 24, 1989, when one of the most infamous serial killers in United States history was executed. A crowd of nearly 200 people gathered outside the state prison in Starke, Florida, to cheer when they learned that Theodore "Ted" Bundy had died in the prison's electric chair.¹ His execution sent shock waves through a large

community of death-penalty opponents whose efforts to convince public policy makers that capital punishment was inappropriate for criminals as violent as Bundy were losing their effectiveness. But only seven months later, on August 14, 1989, the tide quickly turned when Gary Dotson became the first man to be released from prison after DNA tests were used to demonstrate his innocence.²

The realization that scientific evidence as robust and reputable as DNA could be used to prove the innocence of wrongfully convicted defendants was a new opportunity that eventually gave birth to the modern innocence movement. Until that time, public opinion over the deathpenalty was divided along ideological lines. The resulting lack of a strong public consensus created a heavy burden on those seeking to abolish the death penalty for good. But in the face of new scientific evidence that revealed horrific errors committed by our justice system, it became evident that public support for the death penalty might eventually subside on its own. As a result, the vigorous movement to abolish the death penalty in the United States, which was so active during the decade of the 1980s,³ quickly gave way to a new and more powerful campaign to identify wrongly convicted prisoners and advocate for their immediate release.

The Innocence Network

Beginning in 1993, specialized educational clinics affiliated with law schools and journalism schools throughout the United States were established to review the cases of prisoners claiming to be innocent.⁴ Known as Innocence Projects, this concept, made famous by well-known criminal defense attorneys Barry Scheck and Peter Neufeld in New York, has been a successful one. Young students eager to make a difference while learning the nuances of criminal law are able to study actual cases in significant detail within a clinical setting. Further action is taken when a case is identified as having evidence that could realistically demonstrate the innocence of the prisoner. In most instances, this involves the existence of biological evidence that can be subjected to modern DNA testing techniques.⁵ Since the exoneration of Gary Dotson in 1989, more than 230 convictions have been overturned due to the efforts of the Innocence Project in New York City and its affiliates throughout the United States.6

We recognize the overwhelming value of the innocence network and its focus on correcting the human tragedy of wrongful convictions. But in a 2009 article titled "The Wrongful Conviction of Forensic Science," we chronicled what they described as erroneous public policy rhetoric emanating from several high-profile activists within the innocence network.⁷ Much of this rhetoric disparaged the forensic sciences to the extent that reasonable people might be persuaded to distrust the work being performed in America's crime laboratories. But as we observed, another factor magnified the problem considerably:

To the advantage of many within the innocence network, these statements were rarely, if ever, subjected to any serious examination and were quick to appear as front-page stories in major newspapers throughout the United States. With public enthusiasm for forensic science being so widespread, the notion that it could actually be contributing to the imprisonment of innocent citizens was a story too compelling to ignore.⁸

The National Academy of Sciences Report of 2009

A dramatic close to these 20 turbulent years came in February 2009 when the National Academy of Sciences (NAS) in Washington, D.C. released one of the most anticipated reports in its history, titled *Strengthening Forensic Science in the United States: A Path Forward*. Despite how it was characterized in the media, the report was largely the result of cries from the forensic science community calling for an objective evaluation of the profession and the identification of areas where resources were most needed.⁹

For years, leaders in the forensic science community advocated for the infusion of funds into the forensic sciences so that laboratories could keep pace with growing demand, and research could be conducted to better demonstrate the validity of the most commonly practiced disciplines. Senator Richard Shelby of Alabama was a key proponent. In 2006, he urged the National Academy of Sciences to study the problems facing America's forensic science laboratories and develop ways to help solve them.¹⁰ The result was the creation of the 2006 Committee on Identifying the Needs of the Forensic Science Community.

Contrary to some perceptions, the committee's historic report did not claim or conclusively demonstrate that the most commonly practiced forensic disciplines were unreliable. In some instances, the report argued quite the opposite.

For decades, the forensic science disciplines have produced valuable evidence that has contributed to the successful prosecution and conviction of criminals as well as to the exoneration of innocent people.¹¹

The primary concern raised by the report was the "substantial evidence indicating that the level of scientific development and evaluation varies substantially among the forensic science disciplines."¹² In other words, the committee recognized the need for a more robust and accessible body of research that would allow the validity of these disciplines to be verified.

The reason, however, that the NAS report represented the end of such a tumultuous and contentious period was the necessity it created for collaboration and the establishment of good partnerships to ensure that the forensic sciences are given the support that they need. For the most vitriolic activists in the innocence network, this will not necessarily be good news. As forensic science practitioners expand their collaborations with reputable academic institutions, we argue that there will be a decreasing tolerance for public policy recommendations that are based on ideological propaganda.

Dr. Roger Kahn is the former president of the American Society of Crime Laboratory Directors and a practicing DNA expert in Texas.¹³ He recently remarked about the precedent for science to transcend ideology. According to Dr. Kahn,

this clearly happened with DNA after the second report by the National Research Council on DNA testing. It led to important research and publications that resolved a variety of statistical questions in a rigorous manner. In doing so it strengthened the underpinnings of forensic DNA.¹⁴

Unfortunately, the NAS report of 2009 has a major flaw. Its authors lent credence to accusations that forensic science malpractice and invalid forensic methods are significant causes of wrongful convictions without any authoritative, objective research cited to support those claims. The report noted that "in some cases, substantive information and testimony based on faulty forensic science analyses may have contributed to wrongful convictions of innocent people."15 It also claimed that "imprecise or exaggerated expert testimony has sometimes contributed to the admission of erroneous or misleading evidence."¹⁶ But no attempt was made to evaluate the frequency and severity of these instances. In light of the fact that erroneous forensic science was presented in the report as a major reason to create a new federal bureaucracy to oversee the forensic science community, it is surprising that the NAS report did not demand a more objective and thorough review of cases where forensic science malpractice is blamed for wrongful convictions and other complications occurring in criminal trials.

Contextual Contamination of Forensic Evidence

We are of the opinion that the blame assigned to faulty forensic science for wrongful convictions is a myth perpetuated by a psychological phenomenon known as "contextual contamination," which has been shown to complicate psychological experiments by creating inappropriate central tendencies and anchoring effects.¹⁷ As it applies to the interpretation of forensic evidence, this means that certain circumstances and conditions can cause scientific findings to be misconstrued as confirming guilt or innocence when, in fact, they do not. It also means that forensic evidence and testimony presented at trial can be unfairly characterized as faulty when, in fact, it is not.

The Mischaracterization of Forensic Evidence as Being Faulty

It was a hot and humid evening in Burlington, North Carolina, on July 28, 1984.

Jennifer Thompson, then a 22-year-old college student, had gone to bed early in her off-campus apartment. As she slept, a man shattered the light bulb near her back door, cut her phone line, and broke in.^[18] Thompson awoke to find a man pressing a knife blade to her throat. When she offered the man credit cards, money, and even her car, he simply said "I don't want your money."¹⁹

As she was being raped, Jennifer Thompson consciously focused on memorizing details about her attacker in the hopes that she would be able to identify him in the future. According to Thompson, she was "just trying to pay attention to a detail, [so] that if I survived, and that was my plan, I'd be able to help the police catch him."²⁰ Eventually, she would identify 22-yearold Ronald Cotton, a local restaurant worker with a criminal history of pleading guilty to breaking and entering and sexual assault. Thompson was certain that Cotton was the man who had raped her. It would take only 40 minutes for a jury to agree with her and sentence Cotton to 50 years in prison. Two years later, Cotton would also be convicted of a second rape that occurred around the same time.²¹

After 11 years in prison, DNA evidence helped to reveal Cotton's innocence. It also confirmed the real identity of Jennifer Thompson's rapist, Bobby Poole, who was being held in the same prison as Ronald Cotton for a separate offense. In fact, their physical appearances were so similar that inmates frequently mistook Cotton for Poole, and vice versa. But it was during the coverage of the O.J. Simpson murder trial in 1995 that Ronald Cotton learned about DNA evidence and began his own crusade to conclusively prove that his conviction was erroneous.²² Jennifer Thompson and Ronald Cotton, who are now friends, work collaboratively to help raise awareness about the risks of eyewitness identifications.²³

By all accounts, the conviction of Ronald Cotton was overwhelmingly fueled by the certainty of the victim in her identification of him. During the trial, Thompson pointed to Cotton and affirmed "[Cotton] is the man who raped me."²⁴ The only forensic evidence presented to jurors in the case, however, was "a piece of foam found [at the crime scene] that seemed to come from one of his shoes."²⁵ Investigators later determined that the material was consistent with a pair of athletic shoes worn by Ronald Cotton—but inconsistent with material in Jennifer Thompson's shoes.

Despite the fact that

the foam rubber could have come from any one of a thousand athletic shoes in Almanac County, the possibility that it might have matched one of Ronald Cotton's shoes provided police reason to believe [that it may be a link] to the perpetrator.²⁶

Perhaps this is why the Innocence Project, as in many other cases, lists "invalid or improper forensic science"²⁷ as a contributing cause of Ronald Cotton's conviction.

What is troubling about those who blame faulty forensic science for Cotton's conviction is their apparent lack of interest in whether the foam rubber was actually consistent with Ronald Cotton's shoes. Indeed, from a scientific perspective, this would be the primary consideration in determining whether or not the forensic evidence was improper. It would also matter whether or not the significance of the evidence was exaggerated during the trial. But no indication was found in the public record that such an instance of malpractice occurred. This includes summaries of the Ronald Cotton case published by the Innocence Project,28 the Center on Wrongful Convictions at Northwestern University,29 and the website for the Department of Justice's DNA Initiative.³⁰ The fact that DNA evidence was eventually used to demonstrate Cotton's innocence has no bearing on the validity of any forensic tests that were presented at his trial.

The Steven Barnes Case

Another high-profile case that became distorted by the Innocence Project was the conviction and exoneration of Steven Barnes. "Barnes was convicted in 1989 for the rape and murder of Kimberly Simon, whose body was found four years earlier near the Mohawk River in upstate New York."³¹ He was released from prison on January 9, 2009, when DNA testing "yielded conclusive results on sperm cells from the victim's body and clothing— none of which matched Barnes."³²

Forensic evidence presented by the prosecution during Barnes' trial included soil samples collected from the tires of Barnes' truck, which were similar to soil samples collected from the crime scene.³³

Expert testimony was also given that an imprint on the outside of the same truck was *similar* to the fabric pattern of a particular brand of jeans worn by the victim when she was killed. [Emphasis in original.]³⁴

In a commentary published on February 18, 2009, by *Crime Lab Report*, it was noted that one of the lead forensic examiners who testified in Barnes' trial stated emphatically "that the soil and fabric-pattern evidence were non-specific and could not be used to identify the perpetrator."³⁵

Sadly, Innocence Project cofounder Barry Scheck used the occasion of Barnes' exoneration to blame wrongful convictions on bad forensic science.

This is the latest in a long line of wrongful convictions based on improper or invalid forensic science that were ultimately overturned through DNA testing. Until there are clear national standards about what kind of forensic science can be allowed in court, more people like Steven Barnes will be wrongfully convicted while the actual perpetrators of violent crime remain at large.³⁶

DNA Activism—An Emerging Threat to Public Safety

It is critical to understand that DNA tests did not exonerate Ronald Cotton or Steven Barnes. In fact, DNA has never exonerated anyone. In the Barnes case, for example, it was the compelling arguments made by Innocence Project representatives, who first took on his case in 1993, that the DNA tests were proof of innocence.³⁷ The foundation of this argument necessarily rested on the assumption that the sperm cells recovered from the victim were deposited as a direct result of her rape. Any possibility that they were deposited prior to the rape as a result of consensual sex with another partner would have to be ruled out in order for the DNA tests to be interpreted as evidence of factual innocence. In many cases, this may depend entirely on the word of the victim.

Forensic science is incapable of determining guilt or innocence. The term "DNA exoneration," used so frequently by journalists who report on overturned convictions, is a misnomer. DNA does not exonerate innocent prisoners— people do. As the Ronald Cotton and Steven Barnes cases demonstrate, very critical and sensitive leaps of logic are needed to cross the line that divides a DNA test result from the confirmation of innocence. Even though DNA results may seem intuitively exculpatory, extreme caution must be exercised. For this reason, the use of DNA evidence to overturn previous convictions is a profoundly serious matter that should be left to the devices of equally serious professionals.

In a 2001 interview of Innocence Project cofounder Peter Neufeld, which was aired by University of California Television, host Harry Kreisler asked Neufeld what "kept him going" despite the toll that his civil rights work must take on his personal life. Neufeld's answer was revealing:

The real thing is a desire to see things change. And to the extent that [a] case can have an impact on affecting the minds of just 12 people, not just about this case, but perhaps prospectively changing their outlook on justice, on racism, on the drug wars, on sexism, and on all kinds of issues is something that's terrific to be a vital part of. ³⁸

In professional environments where scientific thinking is deemed critical to achieving successful and reliable outcomes, the desires that Neufeld explained are considered to be a dangerous contextual bias. In the world of science, efforts to change the status quo simply for the sake of change are risky when such efforts are not guided by reliable research or the thoughtful consideration of alternative hypotheses.

In a 2006 article published in *Forensic Science International*, researchers Itiel Dror, David Charlton, and Ailisa E. Peron of the School of Psychology at the University of Southampton warned of the dangers of bias in searching for the truth. They explained that

professionals must be able to dissociate themselves from extraneous contexts and other influences that may interfere with their ability to examine, evaluate, and judge the relevant information.³⁹ To the extent that the public policy tactics of the Innocence Project and its affiliates in the innocence network are haphazard and inconsistent, difficult questions should be asked about the capacity of postconviction litigators to honestly and properly interpret the significance of forensic test results. Furthermore, intense desires to seek exonerations should be construed as a contextual bias that requires due caution to be exercised. As Judge Morris Hoffman pointed out in an article published by the *Chicago-Kent Law Review* in 2007:

Sadly, the empirical literature on wrongful convictions is itself woefully infected with the mythology of factual innocence. Part of the problem, of course, is definitional. How does one determine factual innocence after the system—whose whole purpose is supposed to be truth-finding—has determined, whether by plea or trial, that a defendant is in fact guilty? This is the mother of all confirmation bias problems.⁴⁰

The Rape and Murder of Sharra Ferger

The potential injustices that can result from the misinterpretation of postconviction forensic evidence were thankfully, by all accounts, avoided after the tragic death of a nineyear-old girl in Pasco County, Florida.

On October 3, 1997, nine yearold Sharra Ferger was lured out of her... home late at night and found murdered the next day. On the night she was abducted, she was wearing a green T-shirt she often wore to bed. She was stripped from the waist down. Two men then took turns raping her, one viciously biting her shoulder. They also scratched and beat her. She was then stabbed 46 times, 9 times in the head.⁴¹

Garry Cannon, 17, was convicted for the murder but could not be executed due to his age at the time of the crime. According to a report in the St. Petersburg Times, Cannon was linked to the crime through DNA evidence. A second perpetrator, Sharra's uncle, Gary Cochran, 39, would plead guilty a year later.⁴²

What makes this case so instructive was the potential for a wrongful exoneration if the circumstances had been just a bit different. The only forensic evidence linking Cannon to the murder was DNA evidence. Cochran's role, on the other hand, was confirmed by the comparison of his dental impressions to a deep bite mark found on Sharra Ferger's shoulder. But if DNA tests had not initially linked Cannon to the murder, and if Cochran had been convicted based on the bitemark evidence, Cochran might later have been exonerated when subsequent DNA tests revealed that he, in fact, was not the contributor of biological evidence collected from Ferger's body. Based on what is known now, this could have been a wrongful exoneration resulting from the contextual contamination of the forensic evidence.

One could argue that this scenario is unreasonable because Cochran would likely have snitched on Cannon. But if this case had occurred prior to DNA testing and if Cannon made a compelling claim of innocence, it may have been difficult to link Cannon to the crime, particularly if he was excluded as the contributor of the bite mark on the victim's shoulder. All of these complex nuances illustrate that postcon-

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viction forensic evidence must be treated with the same degree of care and caution as evidence used during trial. As the 2003 exoneration of Steven Avery in Wisconsin demonstrates, the stakes can be a matter of life and death.

From Exoneration to Murder—The Steven Avery Case

In 2003, 18 years after he was convicted for "the brutal attack of a woman jogging on a beach near Two Rivers, [Wisconsin,]"⁴³ Steven Avery was exonerated when a judge determined that DNA tests were conclusive proof of his innocence. But in 2007, Avery would be convicted of murder and sentenced to life in prison with no chance of parole. "You are probably the most dangerous individual ever to set foot in this courtroom," Judge Patrick Willis remarked. "From what I see, nothing in your life suggests that society would ever be safe from your behavior."⁴⁴

Two years before his murder conviction, Avery became "the first Wisconsin prisoner freed by the … Wisconsin Innocence Project, which used DNA tests to link another man to the assault that put Avery in prison."⁴⁵ But in considering his sentence for the murder conviction, Judge Willis

reviewed Avery's history of convictions for burglaries, threatening a woman with a gun and dousing a cat with gasoline before throwing it in a bonfire, before sentencing him. The offenses escalated over time, Willis said, and the latest one—[the murder of Teresa Halbach]—was a "calculated" case of premeditated murder.⁴⁶

According to reports on the Teresa Halbach murder, Avery bound and gagged his victim, and then invited his young learning-disabled nephew, Brendan Dassey, to sexually assault her:

Dassey had told the investigators that, after getting off his school bus Oct. 31, 2005, he took mail to Avery's trailer. There, Avery invited Dassey to have sex with Halbach, who was handcuffed, shackled and screaming. Dassey went home briefly, then returned, stripped, raped Halbach, then, after a discussion with Avery, helped bind and stab her before the pair took her to a garage where Avery shot her. After that, according to the confession, the pair burned her body in a pit.⁴⁷

In the rape case for which Avery served 18 years before being exonerated, the victim, Penny Ann Beernsten, described what happened to her along a stretch of Lake Michigan beach in 1985.

It happened in a beautiful place. I was out jogging when a man grabbed me from behind and pushed me into a wooded area. When I screamed, he choked my windpipe; when I fought back as he tried to rape me, he began beating and strangling me. Finally I lost consciousness. My last thoughts were: "I wish I'd kissed my son goodbye this morning" and "my daughter's last vision of me will be of my dead, beaten body."⁴⁸

Beernsten would later identify Avery in a lineup.⁴⁹ Avery was eventually exonerated when his DNA was excluded

as being the same as biological samples recovered from Beernsten.⁵⁰ But what if the DNA was not deposited during the initial attack? After all, Penny Ann Beernsten had been strangled and slipped into unconsciousness. What if Avery was, in fact, the initial attacker but failed to ejaculate? What if he then invited an accomplice to sexually assault Beernsten while she was unconscious—just like he allegedly did in the Teresa Halbach murder?

Penny Ann Beernsten is now an advocate for reforming eyewitness identification procedures. But as is the case with all postconviction DNA testing, the most defendants can hope for is to be excluded as the contributor of biological evidence. Science cannot confirm innocence. Thoughtful and knowledgeable people must look at the totality of the evidence and decide for themselves what the postconviction forensic tests actually mean. We can only hope that the Avery exoneration was not the result of contextual contamination, but rather a careful and collaborative examination of the evidence.

Only Steven Avery knows if he attacked Penny Ann Beernsten on a Wisconsin beach in 1985, but one thing appears certain. Had he not been exonerated, Teresa Halbach might be alive today and young Brendan Dassey might not have gone to prison. It is possible that strict national standards and better professional oversight are needed to govern postconviction litigation practices. But an even higher priority should be placed on providing specialized training to criminal justice professionals in the investigative interpretation of forensic evidence. Unlike the image portrayed by modern television programs, forensic scientists are rarely given access to all of the facts in criminal cases. For this reason, they cannot be relied upon to judge the relationships that exist between forensic testing results and circumstantial facts gathered by investigators. Scientists can certainly be helpful in the process, but ultimately judges and lawyers must fully and properly evaluate forensic evidence before and after a conviction.

The Innocence Project Changes its Strategy

After Steven Barnes was exonerated in 2008, Barry Scheck set the tone for a new approach that the Innocence Project would take in advancing its campaign to discredit the forensic sciences. According to Scheck, "Unvalidated and exaggerated science convicted Steven Barnes and cost him nearly two decades, but real science finally secured his freedom."⁵¹ This statement represented a significant departure from the previous strategy of blaming wrongful convictions on what Scheck and his organization repeatedly termed "faulty forensic science" or "unreliable/limited science." But after we reported on the Innocence Project's mischaracterization of forensic science as often being faulty, there was a new effort by Barry Scheck and Peter Neufeld to characterize various forensic disciplines and practices as simply being "invalid."

This new tactic of blaming wrongful convictions on "invalid" science provided the Innocence Project with an escape hatch that did not exist before. Because their previous attempts to blame wrongful convictions on "faulty forensic science" were demonstrated to be erroneous, the more subjective interpretation of forensic evidence as being "invalid" would be easier for them to defend—not because forensic science disciplines are actually invalid, but because innocence activists could simply create a definition of validity that suited their own purposes.

As Barry Scheck's comment following the Barnes exoneration suggested, the primary strategy now being employed by the Innocence Project is to hold DNA up as the standard for valid forensic science—or as Scheck opined, a "real science." The basis for this strategy, however, is illogical and caters to the layperson's lack of knowledge about DNA testing.

DNA Testing in Proper Perspective

Forensic DNA testing can be used effectively to demonstrate the innocence of wrongfully convicted prisoners when it is employed responsibly and case circumstances leave unanswered questions about the origin of biological evidence. In most overturned convictions, DNA testing was not feasible at the time of the original trials. Therefore, DNA provides an opportunity to undo miscarriages of justice even years after they were committed. But the recent strategy of anointing DNA as a standard of science that other traditional forensic disciplines fail to meet is grossly unfair and not based in reality.

DNA results are statistical in nature, so they are often perceived as being more scientific. DNA profiles are sets of numbers that can be easily entered into a spreadsheet and lend themselves quite nicely to being searched through complex databases. Probabilities can then be established and reported to express the likelihood that a particular DNA profile will occur randomly in particular segments of the human population. Unfortunately, there is a common misconception that these probabilities represent rates of error, which was famously magnified in 1993 by the United States Supreme Court in its landmark decision in Daubert v. Merrell-Dow Pharmaceuticals, Inc.⁵² But in many ways, the testing of DNA is very similar to its other forensic cousins such as latent print identification or firearm identification (ballistics). Education, training, expertise, and professionalism are needed to properly interpret all scientific evidence-including DNA. The actual rate of error in the practice of forensic DNA testing is currently not known.

Understanding Forensic Science Malpractice

Systemic failures in forensic science happen from time to time just as they do in other critical professions.⁵³ But we have come to learn through first-hand experiences as accreditation inspectors⁵⁴ and directors of internationally accredited forensic science laboratories⁵⁵ that such failures are almost always a symptom of an organizational deficiency, not junk science. These weaknesses can be repaired with improved management practices, improved levels of funding to meet demand for services, and better overall methods for managing quality. The 1996 National Academy of Sciences report on DNA testing acknowledged that a key element of quality assurance is

the responsibility of laboratory managers for all aspects of laboratory operations and performance, including definition and documentation of standards for personnel training, procedures, equipment and facilities, and performance review.⁵⁶

When organizational cultures erode for any variety of reasons, the likelihood that employees will make mistakes or commit serious ethical infractions will increase.

Roughly three million cases are submitted to publicly funded crime laboratories each year costing taxpayers approximately \$1.1 billion.⁵⁷ The percentage of these laboratories that achieved accreditation status grew from 71 percent in 2002 to 82 percent in 2005.⁵⁸ Of all laboratories currently accredited by the American Society of Crime Laboratory Directors/ Laboratory Accreditation Board (ASCLD/ LAB), 73 percent achieved accreditation for the first time after 1992.⁵⁹

The vast majority of the 232 wrongful convictions we studied occurred prior to 1989 when forensic science accreditation had yet to revolutionize practices in forensic science laboratories.

Based on the current annual case volume, if publicly funded forensic science laboratories had an overall failure rate of 0.01 percent, which would be an impressive record of quality in any service industry, the total number of cases involving some sort of forensic science malpractice would still amount to a disturbing 300 cases each year. But consider a hypothetical scenario in which 1,000 erroneous laboratory results go undetected by laboratories, investigators, and trial courts, **and** where the malpractice contributes directly to a wrongful felony conviction. Although this is a grossly unreasonable scenario in our opinion,⁶⁰ the chance that one of the three million cases worked by forensic science laboratories in the United States each year would directly result in a wrongful felony conviction would be approximately 0.0003 percent (that is three ten-thousandths of a percent.)

Recent Data in Overturned Convictions

Each wrongful conviction inflicts horrific pain on the victims and their families. For this reason, exonerations tend to elicit a prompt response from local journalists and strong emotional reactions from the relevant community. These emotions are to be expected; however, they do not necessarily allow for a clear and thoughtful examination of wrongful convictions or an accurate diagnosis of their causes. There are signs that journalists are beginning to re-examine the complexities of wrongful convictions in the United States. In January 2009, the Richmond Times-Dispatch reported that the Urban Institute, "a 40-year-old organization that studies social and economic issues to promote sound public policy and effective government,"61 was awarded \$300,000 by the Department of Justice to examine the causes of wrongful convictions. In the Times-Dispatch report, a quote from Brandon Garrett, a professor of law at the University of Virginia, was included to put the complexity of postconviction litigation in perspective. According to Garrett, "wrongful-conviction cases are harder to study, much less generalize about."62

With this in mind, we examined the 201st through 232nd convictions overturned by the innocence network. In keeping with the methodology and principles published in *The Wrong-ful Conviction of Forensic Science*, each case was studied to determine the role of forensic evidence at the original trial. In several instances, trial transcripts were available for review.⁶³ The tables on pages 16–19 provide a summary of this examination.

Discussion

As discussed earlier, forensic science malpractice of a significant nature is rare and is unlikely to contribute to a wrongful conviction even when it does occur. At the time we wrote *The Wrongful Conviction of Forensic Science*, only one wrongful conviction had been associated with an instance of forensic science malpractice occurring in an accredited laboratory. As we observed:

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[I]t was a false exclusion of a rape victim's husband as being the contributor of semen found on a rapekit swab and bedding from the victim's home. The error did not directly incriminate the defendant. Also, the incident occurred in 1988 when crime laboratory accreditation was in its infancy.⁶⁴

Forensic science methods applied in laboratories accredited by the American Society of Crime Laboratory Directors/ Laboratory Accreditation Board (ASCLD/LAB) are subjected to so many checks and balances that the possibility that a catastrophic error or ethical violation would go undetected by both the laboratory's quality management system and the adversarial scrutiny of a trial court is extremely low.

Unfortunately, critics seeking to micromanage the forensic sciences with new bureaucracies and politically charged oversight schemes are unwilling to accept accreditation as a reliable, standalone system of quality control. Even worse, evidence that accreditation does work-the enhanced ability of accredited laboratories to identify failures-is irresponsibly mischaracterized as evidence that accreditation does not work. A laboratory that is able to look critically at its own operations and identify problems is a cause for celebration, not punishment. The internal mechanisms of self-assessment combined with the external mechanisms of peer assessment must be allowed to find and correct weaknesses without the risk of reprisal. If the basic principles of quality control and quality assurance in forensic science become contaminated by politics and the natural inclination of activists to punish what they perceive as wrongdoing, society can expect the forensic science infrastructure in the United States to collapse under its own weight.

When all types of evidence, scenarios, and potential failures in our criminal justice system are considered in the proper context, it is likely that forensic science is, and has been, a leading preventer of wrongful convictions. All criminal justice institutions have a certain capacity to process incoming cases with a finite number of people and resources to get the job done reliably. It is a mistake to think that these institutions operate differently than other types of organizations. If an automotive manufacturing plant, for example, attempts to keep pace with a level of demand that is unmanageable given its current rate of staffing and capitalization, it will be more likely to assemble bad cars. If an accountant is faced with more tax returns than what he or she can handle in a given year, his or her filings to the IRS are more likely to have errors.

When organizations cannot keep up with demand, frustrations and incentives to take shortcuts will erode even the most robust organizational culture in any industry or profession. Certainly, this is not an excuse for gross malpractice or unethical behavior. Such instances cannot be tolerated and must be met with severe consequences. But it is also unethical to deprive prosecutors, public defenders, forensic scientists, and police officers of the resources they need to do their jobs completely and reliably. Who steps in to confront this kind of negligence? Ultimately, it falls on our elected leaders and their constituents to ensure that our criminal justice system has the resources it needs to work reliably and efficiently.

Summary and Conclusions

Eyewitness misidentifications continue to rank as the top factor contributing to wrongful convictions in the United States. No other factor comes close in terms of its collective impact on our justice system. It cannot be underestimated how important it is to accurately and completely tabulate the causes of wrongful convictions before assigning a specific share of the blame to any of them. Future studies subjected to the proper kind of peer review with sufficient transparency must look closer at overturned convictions to determine exactly how they happen and if, in fact, apparent instances of forensic science malpractice can be fairly labeled as such.⁹⁹ It is hoped that the work of the Urban Institute and other independent researchers will succeed in this endeavor. But we warn that political wrangling and activism will contaminate the process and bring discredit to any useful conclusions that are rendered as a result of such studies.

Ultimately, the causes of wrongful convictions are really symptoms of a larger problem. It is the disease that needs to be cured. In the long run, public resources will be better spent on helping to improve the talent base and organizational cultures of our justice institutions. Strong organizations with strong leaders supported by talented, motivated employees are much less likely to make serious mistakes. In this regard, lawyers and judges should pay close attention to the management practices of crime laboratories serving their jurisdiction. Junk science is not a systemic problem in our criminal justice system. But truggling organizations burdened by increasing demand and dwindling resources are a systemic problem.

The next 20 years will hopefully bring new solutions. And if all goes well, the entire criminal justice system will improve its competence at evaluating forensic evidence and ensuring that contextual distortions are not allowed to contaminate criminal proceedings or public policy discussions related to the use of science in our search for justice.

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John Collins has worked in the profession of forensic science since 1982, which includes his tenure as the director of a major Midwestern crime laboratory where he has served since 1998. He is a certified Senior Professional in Human Resources, and consults periodically with crime labs seeking to improve their management systems. He was elected to the board of directors of the American Society of Crime Laboratory Directors (ASCLD) in 2005 and served a three-year term. He was the creator and first editor of the Crime Lab Minute, the official weekly publication of the ASCLD, and also served as the editor for the AFTE Journal, the official quarterly publication of the Association of Firearm & Toolmark Examiners. He is a trained accreditation inspector and has inspected several laboratories throughout the U.S. and overseas. He regularly lectures at colleges and universities in the Midwest.

Jay Jarvis currently serves as a member of the ASCLD/LAB board of directors. He began his forensic science career in 1979, after receiving his master of science in forensic chemistry from the University of Pittsburgh. His scientific experience and training include firearm and toolmark identification; hair, fiber, paint, and glass analysis; shoe and tire impression comparison; arson and explosives analysis; latent fingerprint processing; presumptive blood testing; crime scene processing; and drug identification. He has appeared in court as an expert witness more than 750 times. He began his career in crime lab management in 1998. He is a trained crime laboratory accreditation inspector.

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53. The most publicized and infamous instances of malpractice were associated with a small number of individuals (i.e., Fred Zain, Joyce Gilchrist, Pamela Fish) who did not work in accredited laboratories.

54. Both authors (John Collins and Jay Jarvis) are trained and practicing volunteer-accreditation inspectors serving ASCLD/LAB.

55. Collins is the director of the DuPage County Crime Laboratory in Wheaton, Illinois. Jarvis served as the director of the Georgia Bureau of Investigation laboratory in Summerville, Georgia. Both laboratories are accredited under the international ISO 17025 standard for calibration and testing laboratories. The opinions and views expressed in this paper do not necessarily reflect those of any organizations or persons with whom the authors are affiliated.

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Jarvis & Collins: Contextual Contamination of Forensic Evidence

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98. See footnote 97.

99. Collins and Jarvis, supra, at 26.

^{89.} Id.

Table 1: Original Convictions Attributed Solely To Witness Misidentification

Number of Cases: 11 of 32, Percent of Cases: 34%

					EVALUATIO	VOFFORENS	SIC EVIDENCE
Exoneree	State	Incident	Exonerated	Transcripts	Exculpatory	No Bearing	Malpractice
						or Nonspecific	
Travis Hayes ⁶⁵	LA	1998	2007	Yes	Х		
James Waller ⁶⁶	ТΧ	1983	2007	Yes	Х		
John Jerome White67	GA	1980	2007	Yes		Х	
Gregory Wallis68	ТХ	1989	2007	Yes		Х	
Marcus Lyons ⁶⁹	IL	1988	2007	No		Х	
Steven Phillips ⁷⁰	ТХ	1982-83	2008	No		Х	
Andrew Gossett ⁷¹	ТΧ	2000	2007	No		Х	
Patrick Waller ⁷²	ТХ	1992	2008	No		Х	
Robert McClendon ⁷³	OH	1991	2008	No		Х	
Arthur Johnson ⁷⁴	MS	1993	2008	No		Х	
Thomas McGowan ⁷⁵	ТХ	1985-86	2008	No		Х	

Summary of the Forensic Evidence: In two cases, the convictions of Travis Hayes and James Waller, the forensic evidence was exculpatory. Hairs recovered from bed sheets were shown to exclude James Waller. In eight of the above 11 cases, the convictions were not supported by the forensic evidence. In the conviction of John Jerome White, forensic scientist Benny Blankenship testified that hair samples recovered from the crime scene "could have come" from White. But under both direct and cross-examination, he clearly explained that only similarities were observed and that he could not conclusively identify White as the contributor of the hairs. The defense attorney questioned Blankenship repeatedly about the significance of the evidence, which yielded testimony indicating the state of the art was not sufficient to make conclusive identifications.

Table 2: Original Conviction Attributed Solely to an Informant/Snitch

Number of Cases: 1 of 32, Percent of Cases: 3%

					EVALUATION	OF FORENSI	C EVIDENCE
Exoneree	State	Incident	Exonerated	Transcripts	Exculpatory	No Bearing	Malpractice
						or Nonspecific	
Chad Heins ⁷⁶	FL	1996	2007	Yes	Х		

Summary of the Forensic Evidence: In the trial of Chad Heins, hairs recovered from the crime scene were eliminated as having come from Heins.

Table 3: Original Convictions Attributed Solely to False/Coerced Confessions

Number of Cases: 2 of 32, Percent of Cases: 6%

					EVALUATION OF FORENSIC EVIDENCE
Exoneree	State	Incident	Exonerated	Transcripts	Exculpatory No Bearing Malpractice
					or Nonspecific
James Dean77	NE	1989	2007	No	Х
Debra Shelden ⁷⁸	NE	1989	2007	No	Х

Summary of the Forensic Evidence: Information regarding these two cases was limited. It appears, however, that false or coerced confessions were the primary contributing factors leading to the convictions.

Table 4: Original Convictions with Multiple Causes—Not Supported by Forensic Evidence

Number of Cases: 5 of 32, Percent of Cases: 16%

					EVALUATION OF FORENSIC EVIDENCE
Exoneree	State	Incident	Exonerated	Transcripts	Exculpatory No Bearing Malpractice or Nonspecific
James Curtis Giles ⁷⁹	ТХ	1983	2007	Yes	x
Ronald Cage ⁸⁰	ТХ	1995	2008	Yes	Х
Dean Cage ⁸¹	IL	1996	2008	No	Х
Jerry Miller ⁸²	IL	1982	2007	No	Х
Willie Williams ⁸³	GA	1985	2007	Yes	Х

Summary of the Forensic Evidence: In the above five cases, forensic evidence was limited and/or nonspecific to the point that it had no significant role in demonstrating the guilt of the defendant.

Table 5: Original Convictions Attributed to Multiple Causes—Non-specific Forensic Evidence

Number of Cases: 11 of 32, Percent of Cases: 34%

					EVALUATION OF FORENSIC EVIDENCE
Exoneree	State	Incident	Exonerated	Transcripts	Exculpatory No Bearing Malpractice
					or Nonspecific
William Dillon ⁸⁴	FL	1981	2008	No	Х
Charles Chatman ⁸⁵	ТХ	1981	2008	Yes	Х
Steven Barnes86	NY	1989	2009	No	Х
Rickie Johnson ⁸⁷	LA	1983	2008	Yes	Х
Nathaniel Hatchett ⁸⁸	MI	1998	2008	Yes	Х
Joseph White89	NE	1989	2008	No	Х
Ada Taylor ⁹⁰	NE	1989	2009	No	Х
Thomas Winslow ⁹¹	NE	1989	2009	No	Х
Kathy Gonzales ⁹²	NE	1989	2009	No	Х
Michael Blair93	ТХ	1994	2008	Yes	Х
Byron Halsey94	NJ	1988	2007	Yes	Х

Summary of the Forensic Evidence: With the exception of one case, the above convictions were associated with very weak or non-specific forensic evidence that could not conclusively associate or exclude the defendants. In the trial of William Dillon, dog scent tracking evidence was presented at trial and may have been presented as being more reliable than it actually is. But because dog scent tracking is not a forensic science, it was dismissed for the purposes of this study. In the case of Steven Barnes, exculpatory fingerprint evidence was presented as well as nonspecific pattern and soil comparisons.

Table 6: Original Convictions Attributed to Forensic Science Malpractice

Number of Cases: 2 of 32, Percent of Cases: 6%

					EVALUATION OF FORENSIC EVIDENCE
Exoneree	State	Incident	Exonerated	Transcripts	Exculpatory No Bearing Malpractice
					or Nonspecific
Curtis McCarty ⁹⁵	OK	1986-89	2007	Yes	Х
Kennedy Brewer96	MS	1995	2008	Yes	Х

Summary of the Forensic Evidence: The malpractice cases shown in the above table are clear and convincing instances of forensic science malpractice. In the conviction of Kennedy Brewer, erroneous bitemark testimony was offered by Dr. Michael West, who at the time of the trial, had already been suspended from the American Board of Forensic Odontology for previous malpractice. But the court allowed his testimony despite his professional troubles. The conviction of Curtis McCarty, however, was one of several cases associated with the infamous Joyce Gilchrist who has been implicated in several instances of forensic science malpractice. It must be noted that neither of these convictions involved testimony from scientists who conducted their work in accredited forensic science laboratories.

Updated Data Tabulations for 232 Exonerations

When the data collected during this study are added to the tabulations previously reported by the authors, the following breakdown of the role of forensic science in overturned convictions can be examined:

Table 7: The Role of Forensic Science—by Number and Percent of Cases⁹⁷

Rank	Percent	Cases	Description
1	36%	83	Non-specific science failed to exclude the defendant
2	33%	76	Conviction was not supported by forensic evidence
3	17%	39	Forensic evidence was favorable to the defendant
4	15%	_34	Forensic science malpractice
		232	-

Table 8: Probable Systemic Failures in 232 convictions—by Number and Percent ⁹⁸

Rank	Percent	Instances	Description
1	55%	174	Eyewitness misidentification
2	15%	47	False confessions
3	11%	34	Forensic science malpractice
4	9%	30	Government misconduct
5	9%	28	Informant snitches
6	1%	4	Bad lawyering
		317	





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'tis the Season The NAS "One Year Later" Commemorative Edition



On February 18, 2009, exactly one year ago, on the Oppening day of the AAFS meeting in Denver, the NAS released their long-awaited report on the state of Forensic Science in the US. Some were pleased, some were concerned, some were angry; all were interested in spinning the report their best advantage. In the months leading up to the one year anniversary of the report, a spate of "one year later" commentaries began to surface, in the form of writings, symposia, and conferences.

It is, as yet, unclear what will be the practical implications of the report. One process that will surely influence any decisions regarding "the path forward" is a series of hearings held by the Senate Judiciary Committee. While few were invited to provide live testimony, anyone who wished could submit written testimony.

As we have collectively traveled to 3 different cities over the last week for various gigs, a completely novel POL was just not going to happen in time for this issue. In addition to running a full day workshop at the AAFS meeting on observer bias in forensic science, we participated in a symposium and group writing project at the UCLA law school last week. Norah also presented a forensic science perspective as part of a panel at the AAAS meeting in San Diego, and Keith gave a paper on forensic science education, also at the AAFS meeting. Some steak, (for Keith), lobster (for Norah) and a nice bottle of Pinot were the order of the evening last night in Seattle.

So, to throw our hat into the ring along with the rest of the collective "one year later" commentary, we provide, for your reading pleasure, the exact text of our written testimony to the Judiciary Committee.

In February, 2009 the National Research Council of the National Academies issued their report, Strengthening Forensic Science in the United State: a Path Forward. Although the report shocked much of the general public, for many associated with the judicial system, and even for some forensic scientists, its revelations are inescapable. Although some in the forensic community have been sounding the alarm bell for years, our profession, as a whole, has been chosen stagnation over progress, deliberate ignorance over enlightenment. Given the grave consequences of our work – deprivation of liberty or life on one hand, allowing violent offenders to remain at large on the other - aspiring to anything short of the highest scientific standards fails to serve the best interest of justice. In addition to the obvious impact of questionable forensic work on the safety and security of the populace, an indirect consequence to society at large manifests in an erosion of trust that the judicial system will function fairly and objectively.

Over more than a century of practice, the efficacy of forensic science rarely has been questioned. As Judge Harry T. Edwards' (co chair of NRC group) stated in previous comments to this committee:

Rather, I simply assumed, as I suspect many of my judicial colleagues do, that forensic science disciplines typically are grounded in scientific methodology and that crime laboratories and forensic science practitioners generally are bound by solid practices that ensure that forensic evidence offered in court is valid and reliable. I was surprisingly mistaken in what I assumed. The truth is that the manner in which forensic evidence is presented on television - as invariably conclusive and final — does not correspond with reality.

Judge Edwards further comments on the lack of universally-accepted scientific practices, including:

... The frequent absence of solid scientific research demonstrating the validity of forensic methods, quantifiable measures of the reliability and accuracy of forensic analyses, and quantifiable measures of uncertainty in the conclusions of forensic analyses; ...

These observations go to the heart of the NRC committee's disillusionment with forensic science, and must be addressed if the profession is to regain the professional capital it historically has enjoyed. We take these ideas one at a time.

As so often happens, "validation" has become a buzzword fed to the court as part of an automatic admissibility package. First, it is necessary to appreciate the difference between attempting to confirm the validity of an existing method, and performing fundamental research to determine the capabilities and limitations of a method. The former assumes the validity of the method, then sets out to prove it,

Unfortunately, the intractable response of the forensic community has been simply to support current practice, by proposing "validation" of existing methods, rather than taking a step back and performing fundamental inquiries into the nature of physical evidence. directly antithetical to the scientific method; the latter is what is required, especially in the historical disciplines comprising comparison evidence, such as fingerprints, bullet striations, and shoeprints. True validation forms the basis for a set of interpretation guidelines that support a conclusion incorporating, among other things, the limitations of the procedure (and the evidence) and the uncertainty associated with the result. Unfortunately, the intractable response of the forensic community has been simply to support current practice, by proposing "validation" of existing methods, rather than taking a step back and performing fundamental inquiries into the nature of physical evidence. Unfortunately, this is a Band-Aid approach guaranteed merely to obscure a deep fundamental problem within forensic science.

Second, the idea of quantifying the uncertainty in various aspects of forensic analysis leads directly to a fundamental issue in the justice system, the inherent tension and conflict between science and the law. While the law must definitively resolve the specific issue at hand with, science can only make provisional conclusions, always subject to update based on new information, and always subject to at least some level of ambiguity. At its very core, science eschews the type of certainty required by law; rather, science seeks to measure uncertainty.1 However, because of its long and intimate relationship with the legal system, the applied science described by the adjective forensic has been subtly co-opted by the law; its practitioners have succumbed to the paradigm of the legal system, providing opinions of individualization and identification under the guise of fact, instead of insisting that science be their primary allegiance. Forensic science must seek its scientific roots if it has any hope of retaining, or perhaps, gaining, credibility going forward. Individualization, identification, source attribution, or any other inference of unique common origin is not only unnecessary, it is scientifically unsupportable². Further, such inferences of source must properly remain with the trier of fact; the forensic scientist must restrict herself to quantifying the uncertainty attached to the observation that two items appear to be indistinguishable by the tests performed.

Another observation made by Judge Edwards is:

the paucity of research programs on human observer bias and sources of human error in forensic examinations;

Although the forensic community has made some progress in accepting observer bias as fundamental to the human condition, many retain the misguided notion that subconscious bias may be overcome by education, understanding, of simply brute force of will^{3,4}. While further research into this issue, is clearly necessary, specifically with regard to the specific circumstances encountered in forensic science, no reason exists to delay the implementation of sequential unmasking <u>protocols⁵ designed</u> to minimize the opportunity for such

1 Ten myths of science: Myth #5 ; Science and its Methods Provide Absolute Proof www.bluffton.edu/~bergerd/NSC_111/Ten-Myths.html

2 Cole, S., Forensics without uniqueness, conclusions without individualization: the new epistemology of forensic identification Law, Probability and Risk 2009;

3 www.swgfast.org/SWGFAST_Position_Statement_NAS_ 2009_08_03.pdf

4 Budowle, et. al., A Perspective on Errors, Bias, and Interpretation in the Forensic Sciences and Direction for Continuing Advancement, J. Forensic Sci., 54:798, 2009

5 Krane, D., et al., Sequential Unmasking, A Means of Minimizing Observer Effects in Forensic DNA Interpretation, J. Forensic Sci., 53:4, 2008 bias to affect conclusions derived from forensic analyses.

Another of Judge Edwards' points we would like to address is:

the lack of autonomy of forensic laboratories (which are often subject to the administrative control of law enforcement agencies or prosecutors' offices;

As evidenced by this quote, the problem of undue influence over forensic laboratories by law enforcement is oft-perceived to be simply administrative in nature. Consequently, the proposed solution is to remove the laboratory from the chain of command. This is the situation for all of the government laboratories cited as "independent" by Judge Edwards in the addendum to his comments. While these laboratories are separated administratively and financially from law enforcement, they do not function as truly independent laboratories; they still perform work only for prosecutorial agencies. In our experience, including specific knowledge gained from reviewing some of the aforementioned laboratories, administrative separation does nothing to alter the loyalty to, or perceived affiliation with, law enforcement. To shift that particular paradigm, a laboratory would need to accept work from both prosecution and defense. The criminalists would need to be challenged to act as truly independent scientists, actively seeking alternative explanations for the data, and providing true transparency into their work. The model for this is provided by a few (although not nearly all) private laboratories which perform fee-for-service work for any professional client. Although we do not suggest complete privatization as a solution to this issue, elements of it could be applied to the government laboratory system to foster greater neutrality and openness.

One strong suggestion by the NAS committee is to mandate accreditation of laboratories that perform forensic work. The call for accreditation has been adopted as a chant by, not only the forensic community, but other stake holders, suggesting it as almost a systemic cure-all. We could not disagree more with the notion that accreditation is a universal panacea. While uniform regulation and oversight is useful to create an underlying infrastructure upon which quality casework can be performed, it is neither designed to, nor has the capacity to, guarantee the veracity of results and conclusions produced by forensic laboratories. Like "validation," "accreditation" has been reduced to a buzzword that conveys a false sense of security to the courts and to the public. Yes, accreditation for all laboratories testing physical evidence should be required, but it is really only one piece in the middle of a complex jigsaw puzzle, as the following analysis will demonstrate.

Long before evidence ever reaches the laboratory, it must be identified and collected. The best analysis can never compensate for the failure to collect relevant evidence or store it properly. In many jurisdictions, law enforcement personnel, rather than criminalists, are assigned to process crime scenes. They often receive minimal training and the work force is subject to rotation and turnover. We must direct more attention to training the officers that perform this critical work. And we must realize that collecting evidence requires a much more sophisticated approach than just donning a pair of latex gloves and moistening a swab to collect a blood stain. Even at this early stage in the process, a hypothesis, or better yet competing hypotheses, must be articulated, and the individual tasked with collecting evidence must search for relevant evidence with intelligence. Blindly collecting what appears to be obvious physical evidence will almost certainly leave important clues at the scene.

In the laboratory, the really important decisions bookend the actual analysis (and it is only the analytical procedures on which accreditation focuses). Prior to testing, the criminalist must decide which items of evidence should be analyzed, using which protocols; he must determine which screening tests should be performed before a piece of evidence is consumed using an analytical procedure. The most accurate and reliable test can be performed, but if it answers an irrelevant question, the results are useless. As an example, your doctor listens to your complaints, examines you, and orders five tests. The laboratory conducts them all correctly, in duplicate, gives results that include an error range, and also provides information about the range of normal values, in complete compliance with their SOP and QA guidelines (in other words, meeting all of the requirements of accreditation). But if the doctor has ordered the wrong tests, the results of those tests will at best be worthless, and at worst lead the doctor in the wrong direction, resulting in a diagnosis that is incorrect, and potentially harmful.

The interpretation of results after the analysis comprises the other bookend. As we have discussed previously, interpretation of laboratory results must be supported by true scientific validation that determines the capabilities and limitation of the method. Assumptions must be recognized, and explicitly incorporated into the interpretation. Finally the written report must reflect the totality of the analyst's results, inferences, and conclusions, and it should be written in clear, informative language; testimony should hold no surprises.

Further, it is crucial to understand that forensic science does not operate in a vacuum; rather it interfaces with the legal and judicial system at every level. Thus, rather like a dysfunctional family, the failures are systemic, supported at each step of the process by the larger entity. Not only do forensic practitioners bear the responsibility to ensure that the craft they practice is valid and reliable, the scientific community at large must embrace forensic science in order to hold the profession to the highest scientific standard. Historically, this has not been the case, as many of the forensic disciplines evolved under the auspices of law enforcement rather than academics. Attorneys must educate themselves to use forensic science responsibly, and judges must be aware of the capabilities and limitations for various forensic disciplines.

To again quote Judge Edwards' comments to this committee:

The judicial system is encumbered by, among other things, judges and lawyers who generally lack the scientific expertise necessary to comprehend and evaluate forensic evidence in an informed manner, defense attorneys who often do not have the resources to challenge prosecutors' forensic experts, trial judges (sitting alone) who must decide evidentiary issues without the benefit of judicial colleagues and often with little time for extensive research and reflection, and very limited appellate review of trial court rulings admitting disputed forensic evidence.

In short, fixing forensic science alone is insufficient when addressing the shortcomings of science practiced within the context of law. The legal side of the equation must be remedied as well.

In some sense, the players who struggle the most with science are judges. Judges work in relative isolation, typically consider only information provided to them by the litigating attorneys, and are afforded few case-independent educational opportunities. Additionally, because judges are the ultimate authority figure in trial-level litigation, they are rarely questioned, certainly not from below, and all-too-rarely from it is crucial to understand that forensic science does not operate in a vacuum; rather it interfaces with the legal and judicial system at every level. Thus, rather like a dysfunctional family, the failures are systemic, supported at each step of the process by the larger entity.

above. Yet they, and they alone, are the gatekeepers of how and when forensic evidence interfaces with the criminal justice system. Educating judges about physical evidence must be a priority if we are to elevate the use of forensic evidence in the courts.

While judges are not and should not attempt to become scientists, neither should attorneys. To avoid this temptation, both prosecution and defense must have equivalent access to qualified experts. The current situation is clearly lopsided, as the prosecution has free access to government laboratory scientists, while most defendants must beg for court-mandated funding to hire independent experts. As long as the U.S. maintains an adversarial legal system, the best opportunity for justice to be served is to ensure that attorneys on both sides have access to commensurate resources.

Finally we address transparency, an element sadly lacking in many jurisdictions. We are constantly dismayed at the attitude that discovery is somehow a shell game, that defense must ask three times nicely, using the right words, to obtain certain pieces of information from the government crime laboratory, such as error logs or underlying data. A better model for discovery is the military model, detailed in the *Uniform Code of Military Justice*. Although a Court Martial proceeds in a similar fashion to a civilian criminal trial, with full advocacy from both sides, complete transparency in discovery is both required and uniformly executed. This streamlines the process and minimizes theatrics. The civilian criminal justice system would do well to emulate this model.

To quote Judge Edwards a final time:

As the committee's report makes clear, what is needed is a massive overhaul of the forensic science system in the United States, both to improve the scientific research supporting the disciplines and to improve the practices of the forensic science community.

The path forward for forensic science remains shrouded in uncertainty. We have addressed a few of the most pressing issues here and look forward to continuing to participate in elevating our profession. We leave you with this closing thought:

Forensic science developed historically as an adjunct to the law enforcement effort, subject to the same point of view (bias) as law enforcement. In our parlance, forensic science has been used for verification, simply corroborating what is believed to be true without actually challenging it. However, science is capable of providing much greater value to the law, by serving as an *independent check in the administration of justice.* The paradigm must shift away from science used in blind support of law enforcement to science employed as one instrument, among many, with which to administer justice.

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