

The CACNews

News of the California Association of Criminalists • Second Quarter 2009



The President's Desk

Hot Off the Press: The Report on Forensic Science

The National Research Council of the National Academies' Committees on Identifying the Needs of the Forensic Science Community, on Science, Technology, and Law Policy and Global Affairs, on Applied and Theoretical Statistics Division on Engineering and Physical Sciences released the report titled "STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD" on February 18, 2009. The California Association of Criminalists is in the process of preparing a response to this extensive report.

I read the Executive Summary wearing two hats: as the President of the CAC and more importantly as a member of the CAC. A few main topics in the report immediately surfaced as being directly related to ground-breaking work the membership of the CAC has conducted over the years. First and foremost is our Code of Ethics, followed closely and in tandem are certification and research/education.

We, as members of the CAC, should be very proud of our Code of Ethics and the enforcement policy of the Code of Ethics. The CAC Code of Ethics was first adopted by the membership on May 17, 1957 with the most recent revision on May 17, 1985. Twenty four years without the need for further revision illustrates the ability of this code to withstand not only the test to time, but also changes in the science used in the field, and changes in the legal arenas in which our analyses are utilized. It has been used as a model for numerous other forensic science organizations including most recently the American Society for Crime Laboratory Directors Laboratory Accreditation Board's Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists (adopted December 6, 2008). It is our responsibility to continue this deep seated tradition and be proactive in the formulation of the national code of ethics as identified in Recommendation 9 of the NAS report.

Recommendation 9:

The National Institute of Forensic Science (NIFS), in consultation with its advisory board, should establish a national code of ethics for all forensic science disciplines and encourage individual societies to incorporate this national code as part of their professional code of ethics. Additionally, NIFS should explore mechanisms of enforcement for those forensic scientists who commit serious ethical violations. Such a code could be enforced through a certification process for forensic scientists.

We, as members of the CAC should be very proud our leadership role in the certification of forensic professionals. The CAC began exploring certification for criminalists in October of 1975 with the formation of the Certification Committee. The original charge was to gather information regarding other professional organizations offering certifications and to determine if the CAC membership would be in favor of certification. At the May 1976 membership meeting the committee reported back to the membership that yes, the majority of

the membership was in favor of certification. Thus the Certification Committee began the development of generalized standards for certification in the fields of drug analysis and general criminalistics¹. The CAC differed from the efforts of the AAFS and did not resume the pursuit of certification until 1986. The first pilot certification examination was given on February 14, 1989. The work product of the CAC formed the basis for the American Board of Criminalistics, a national certification program. The ABC was incorporated in 1989. Many of the individuals involved in this national effort were CAC members. Again, it is our responsibility to continue this deep seated tradition and be proactive in the formulation of the national certification program as identified in Recommendation 7 in the NAS report.

Recommendation 7:

Laboratory accreditation and individual certification of forensic science professionals should be mandatory, and all forensic science professionals should have access to a certification process. In determining appropriate standards for accreditation and certification, the National Institute of Forensic Science (NIFS) should take into account established and recognized international standards, such as those published by the International Organization for Standardization (ISO).

No person (public or private) should be allowed to practice in a forensic science discipline or testify as a forensic science professional without certification. Certification requirements should include, at a minimum, written examinations, supervised practice, proficiency testing, continuing education, recertification procedures, adherence to a code of ethics, and effective disciplinary procedures. All laboratories and facilities (public or private) should be accredited, and all forensic science professionals should be certified, when eligible, within a time period established by NIFS.

Please turn to page 21

"The CAC will continue its leadership role in criminalistics and be proactive on the remaining recommendations of the NAS report."



Jennifer Mihalovich
CAC President



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Because of the computerized typesetting employed in *The CACNews*, submissions should be made in the form of MS-DOS compatible files on CD or by e-mail. Text files from word processors should be saved as ASCII files without formatting codes, e.g. bold, italic, etc. An accompanying hardcopy should be submitted along with the file. 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...
"Watchful"
eyesockets on a shelf at the Los Angeles Coroner's office. (2002 photo).

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Faye Springer looks at microscopic trace evidence recovered from the I-5 Strangler case in "Knot for Everyone," an episode of *Forensic Files* shown on Tru TV, Nov 02, 2008. (Original air date 2004)



Inter/Micro 2009 in Chicago

The 2009 Inter/Micro conference is planned for July 6-10, 2009 at Chicago, Illinois at the Millennium Knickerbocker Hotel. The schedule includes: Symposia, Monday, July 6: Techniques and Instrumentation; Tuesday, July 7: Environmental and Industrial Microscopy; Wednesday, July 8: Chemical and Forensic Microscopy. Paper presentations held each day, 9 a.m. – 5 p.m. Thurs-Fri., July 9-10: Workshop on Airborne Fungus Spores. This two-day workshop explores air-sampling technology, types of spores, and common airborne species, using and explaining the technical resources and procedures for identifying hundreds more.

For more information, please visit www.McRI.org



2009 TWGFEX in Orlando

The Technical Working Group for Fire and Explosives (TWGFEX) Committee Meetings are planned for September 12 & 13, 2009, and the TWGFEX Symposium will be this September 14, 2009.

This is a one-day seminar for fire and explosion laboratory analysts and scene investigators with presented papers

of interest to each group. The symposium will be followed by a number of workshops. This symposium and courses are sponsored by the National Center for Forensic Science (NCFS), hosted by University of Central Florida (UCF) and funded by the National Institute of Justice. Included in the program: Fire Debris Analysis Demonstration Course; Explosives Debris Analysis Demonstration Course; Organic Chemistry for Fire Debris Analysts Demo. Course; Fire Dynamics Demonstration Course; Post-Blast Investigation Demonstration Course.

The fee for registration is paid by the NCFS, courtesy of the National Institute of Justice. A registration form is available at www.ncfs.org/training.html. For more information: Contact NCFS, Orlando (407) 823-6469, Fax: (407) 823-3162.

Glasgow Hosts 5th Triennial Meeting of the European Academy of Forensic Science (EAFS)

The first UK meeting of EAFS will be Sept 8-11, 2009 in Glasgow at the University of Strathclyde. The theme of the meeting is knowledge exchange: the cycle of knowledge creation, transfer and application. This will include presentations from high profile experts from outside and from within forensic science on a wide range of related topics including research and development, education and training, standards and competence. There will also be a range of presentations on specific areas of forensic science such as digital evidence, trace evidence, DNA and others. We have also developed an exciting program of workshops which will focus on the development of practical skills facilitated by experts in the field.

Sessions cover a wide range of topics including the following: Plenary presentations on a range of research related matters; Education & Training; Identification of Objects; Quality & Competence; Terrorism & Mass Disasters; Interpretation & Evaluation; Trace Evidence; Digital Technology; Analytical Science; Human Identification.

A program of workshops will focus on the development of practical skills facilitated by experts in the field.

In addition to the scientific program you can expect an enjoyable social program for delegates and accompanying guests and the very best of Scottish hospitality, including whisky tasting and a ceilidh after the formal dinner.

Visit www.eafs2009.com/ for more information.

Trace Symposium Materials Online

If you are interested in finding the papers and/or videos based on the oral presentations given at the NIJ/FBI sponsored Trace Evidence Symposium held in Clearwater Beach, Florida, visit nfstc.org/projects/trace/poster.htm. The titles of all the posters presented at that symposium plus links to the posters in the format of a scientific paper may be found.

Bob Blackledge

Forensic Inventors Wanted

The Department of Defense has launched a new effort to fund innovators, engineers, and scientists with good ideas in

Battlefield Forensics. DoD seeks new ideas in this field, and is especially interested to find people that may never have done business with DoD or the government before.

At their new website, www.DefenseSolutions.gov, DoD describes three forensics capabilities that it wants to fund and develop to at least the prototype stage for testing and evaluation: a rugged, multi-test kit to identify explosives, drugs, and heavy metals, a sensitive site exploitation device to collect critical evidence efficiently, and a device that examines cell phone images to determine their origins.

There is also an "Open" topic to submit any good idea in Battlefield Forensics. Excellent ideas submitted in this "Open" category will be given equal consideration for funding. Additional topics in this area may be added to the site at any time.

The site has a simple, self-contained form to submit ideas electronically. For ideas that are selected for development, a rapid kind of contracting will be used that is easy for offerors to understand and use. Organizations and individuals submitting ideas through www.DefenseSolutions.gov, are not expected to be familiar with any aspect of government contracting. All ideas are protected and will not be disclosed beyond the need to evaluate them.

If you have a good idea in Battlefield Forensics, visit their website and submit it; DoD is listening.



Share your news!

**If you have a tidit of news
about yourself or another
CAC member that deserves
recognition in "CACBits," a
job opening, or an upcoming
class, please send it to the
Editorial Secretary.**

Fishing for Clues



The California Association of Criminalists cordially invites you to its **113th Semi-Annual Seminar** hosted by the San Bernardino County Sheriff's Department, Scientific Investigations Division. The CAC Seminar will take place **May 11 through May 15, 2009 at:**

Lake Arrowhead Resort and Spa
27984 HWY 189

Lake Arrowhead, CA 92352
1-800-800-6792 (Reservations)
www.laresort.com

The Lake Arrowhead Resort and Spa is located within the boundaries of the San Bernardino National Forest, 44 miles from Ontario International Airport. The resort is within a short walk to the Lake Arrowhead Village for a refreshing dining and shopping experience.

Special room rates will be honored until April 10, 2009:
\$105 – Alpine View Room / \$155 – Lakeview Room

The rates are based upon single or double occupancy and include the resort fee. They are subject to state and local taxes (currently 7%). Call now to reserve your room and remember to state that you are part of the CAC group.

Planned Workshops:

Leadership; Interpersonal and Organizational Communication presented by Keren Stashower, Senior Consultant
THE CENTRE for Organizational Effectiveness

Current Statistical Issues of Forensic DNA presented by
Dr. George Carmody, Carleton University

"Lights, Camera - Latent Blood Stains!" – Detection, Enhancement, and Photography of Latent Blood Impressions presented by Heather Harlackner, SBSD SID

ASCLD/LAB International One Day Workshop by Anja Einseln, ASCLD/LAB

Drinking and Driving (simulator) Correlation Study presented by SBSD SID and Sheriff's Academy

Abstracts for presentations are currently being accepted. If you are interested in presenting a paper highlighting a case or a technical paper, please contact Paulette Saunchez at psaunchez@sbcscd.org.

The Editor's Desk

When It's All Been Said and Done

Boldly going...

"Captain's log, Stardate 9529.1. This is the final cruise of the starship *Enterprise* under my command. This ship and her history will shortly become the care of another crew. To them and their posterity will we commit our future. They will continue the voyages we have begun and journey to all the undiscovered countries, boldly going where no man... where no one has gone before."¹

Editorial Log: February 27, 2009...

This is the final issue of The *CACNews* under my leadership. Soon it will become the care of another. They will continue the leadership and direction that has transformed The *CACNews* from an organizational newsletter into a forum in which others from all over the nation are seeking to publish articles that have relevancy to the current state of forensic science in this country.

The similarities are striking...

The "final" movie with the original crew of the *USS Enterprise* was the sixth movie and this, the final issue of The *CACNews* under my guidance, is my sixth year. It should be noted though that James T. Kirk somehow made it back for another movie set some 80-100 years later and Montgomery "Scotty" Scott did something similar. So, do not anticipate that you will be seeing or hearing the last of me either!

It will not go without saying...

John Houde is instrumental to the success of The *CACNews*. Without him, it would not nearly be the publication that it not only is but is becoming.

Have you ever considered...

I once again had the privilege of teaching a workshop on ethics to an emerging group of firearm and tool mark examiners. In that workshop I discuss the concept of ethics along with various synonymous concepts such as integrity, character, and principles. I also discuss to a large extent the main threats to being able to maintain and adhere to a code of ethical behavior in our laboratories.² I also asked them to write down their core values, those values they would never compromise no matter the circumstances. I then suggested that if they find their core values being assaulted day after day, maybe it was time to find a new line of work. No one needs that kind of stress.

For a time such as this...

Anyone who knows me also understands that I do not believe in coincidence or happenstance. Science is based on postulating reasons and explanations for observations. While we may not routinely be as active in offering reasons or explanations for why things happen in our lives, our life events have meaning and importance that cannot be pared down to simple coincidence or happenstance.

In reflecting on what I wished to share in this, the "supposed" last of my editorials, I was striving for some last words that would truly leave an impact—something fresh and invigorating. What was I led to write? It is something not so new but hopefully will have a lasting impression. With all the DNA combinations you could have had, you have one in particular. Considering the thousands of years in just the recorded history of mankind, you occupy 70-80 but not just any 70-80. You occupy those years in this particular era. Considering the thousands of square miles you could occupy and influence, you conduct most of your daily life in a span of maybe 10 to 20 of them. Considering all the various ways in which you could be spending your time right now, you are reading this. Who knows but maybe, just maybe, you were *purposed* "for just such a time as this."³

It is interesting—there seem to be three responses as individuals approach the middle range of those 70 to 80 years. They stay the course of what has been laid out before, they change the direction in which their life was seemingly going, or they buy a sports car or some other material object designed to make them younger. The latter two have been

*Anyone who
knows me also
understands
that I do not
believe in
coincidence or
happenstance.*



Ron Nichols
CAC Editorial Secretary

sometimes coined a “mid-life crisis.” I would not argue that term for those who seek to become young once again through some material object. Truly they are facing a crisis of sorts in their life and hoping to find some comfort in something that will eventually deteriorate.

However, what about those who have not changed course? Are they in denial? Though I cannot speak to this group from my own experience, I have known those who continue to do what they always have done because “it is the only thing they or their families have ever known.” Some feel hopelessly trapped. For these, sadly, the crisis is not a mid-life event but a life long experience. Others I know have said the same thing but rather than having a sense of hopelessness, they have excitement and vigor because they know they are continuing with a legacy that will have lasting impact and importance. The hopeless do not see a purpose while the excited have always, in some form, known a purpose.

For those that are contemplating a course change mid-life, it may or may not be the result of a “mid-life” crisis. For those on a quest for self-discovery and self-fulfillment I would argue that it is indeed a crisis, a very self-centered one. For those seeking to reach out to others and trying to have an impact on the lives of others, encouraging them and building them up, I would suggest that it is not a crisis but simply a recognition after all these many years that material things have a limited purpose, others matter and the world does not revolve around us.

Many of us choose our careers and life direction very early on and often it is in terms of what is best for us. Rarely do we have the foresight or even consider where that may lead us, whether or not we will be married, how many kids we will have, or a multitude of other issues. Basically, we are looking simply to ourselves and what will be best for us and often we cannot realize the impact of others until the impact hits. The question is, “What do we do with it once it does?”

There is a license plate frame I see far too often, usually on those cars bought during a “mid-life crisis” that read, “He that dies with the most toys wins.” Actually, he (or she) that dies with the most toys still dies, just like the one without all the toys. Dead is dead no matter how many watches, Palms, Blackberries, or cars someone owned. We get so worked up about having to have the newest and greatest only to find that a scant one to two years down the road, the newest and greatest is now the oldest and likely broken. Even our retirement accounts are deteriorating, some at a relatively rapid pace. They may have made a movie about Howard Hughes but it was neither flattering nor very inspirational and he died with a lot of toys.

Think for a moment—when you think about someone, who do you think most fondly of? Do you think of those who made riches or do you think of those who invested in you as a person? Do you wish to be remembered? Then keep this in mind. In the most widely published, printed, purchased and circulated book the world has ever seen there are many rich men mentioned but few are ever mentioned by name and even those that are named are not named because of their riches, but in spite of them. Those others that are frequently named by name do not have worldly riches but rather have humbly recognized a purpose to invest in the lives of others for a greater purpose than they could ever hope to accomplish on their own. They live on by name for thousands of years not because of worldly investments but because of investing into others in truth and integrity.

There is a song that is a favorite of mine and it’s entitled, “When It’s All Been Said and Done.”⁴ The chorus is:

*When it's all been said and done
There is just one thing that matters
Did I do my best to live for truth
Did I live my life for You
When it's all said and done
All my treasures will mean nothing
Only what I have done for love's Reward
Will stand the test of time*

I asked the class of emerging firearm and tool mark examiners, what their core values were; those values that they would never compromise. I ask you a related question. When it’s all said and done, what in your life will stand the test of time?

When it’s all been said and done...

I have been privileged beyond any possible hope or dream to have been able to serve you and share with you the last six years. My best, now and always, to you and your families.

Ron

¹ Captain Kirk in *Star Trek VI: The Undiscovered Country*.

² I suspect that will become the focus of a later article as I believe that there is a relationship to bias that needs to be explored. Like I said, just like Kirk, you will likely be seeing me again!

³ Holy Bible, Esther 4:14, NLT.

⁴ “When It’s All Said and Done,” Jim Cowan, ©Integrity’s Hosanna Music/ASCAP, 1999.

FEEDBACK

from our readers

Godspeed

I’ve been blessed to serve with some of the most talented and inspiring members of the association over the *gasp* 17 years of producing the *News*. Ron, you have been a pleasure, a hoot, and a source of quiet consideration for the past six years. Your regular, thought-provoking editorials will be missed. All the best, my friend, and please don’t hesitate to send us an Op-Ed when the spirit moves you!

John Houde

Persuasion, Not Truth

After having read the Inman/Rudin paper (Proceedings of Lunch, *CACNews* 3rd Quarter, 2008), I find it somewhat elitist yet necessary. The back and forth pull of forensic scientists and critics serve to refine techniques of forensic science/scientists with the legal system acting as the main avenue for affecting change. The one the major philosophical failing I see from the critics though is the failure to recognize that legal

FEEDBACK

proceedings are not an extension of science nor do they care about 'truth'.

Legal proceedings care about persuading the judge/jury and making their case. Each side attempts to exclude as much evidence as possible to pad their case and highlight the evidence they think makes their case. Tugging emotion is par for the course and forensic science is a way to solidify these emotional sentiments in the minds of those observing while maintaining an air of objectivity. Defense attorneys attempt to capitalize on these sentiments as well as prosecution.

These elements can make forensic science evidence a square peg in a round hole so to speak. The fact that *Brady*, *Giglio*, *Henthorn* and *Crawford* have all been established to ensure the best information moves forward shows us both the tradition and most efficient way for the legal system to deal with inadequacies that arise with forensic science practitioners. Short-circuiting the process to focus solely on Forensic Science while ignoring the system which employs those methods seems a little myopic.

The majority of what I have seen is an inability of the critics to deal with a counter rebuttal, without resorting to an appeal to authority. The bottom line is that it is just as legitimate to critique the critics as it is to critique forensic science.

*Boyd Baumgartner
via the internet*

Misfired Criticisms

In "The Dawn of the 'Forensic Science Provocateur'" [1] Professor Brian Gestring of Cedar Crest College criticizes those "lawyers and business professors that have not been involved in the exoneration processes in any way" and yet "have found a new calling, that of Forensic Science Provocateur." They are "[u]ninhibited by their lack of understanding of forensic science." Apparently, I am one of this rabble, because he cites my 2007 policy study [1] to illustrate how, "[l]ike a flock of peasants with flaming torches and pitchforks, their rhetoric abounds and obscures substance." I may at least take solace in Professor Gestring's gracious recognition that my "efforts and ideas demonstrate a sincere effort to improve forensic science."

Perhaps Professor Gestring is right. He misstates my position, however, thereby casting some doubt on his interpretation of "forensic science provocateurs." Citing my 2007 policy study, Gestring says, "One of his suggestions to minimize error in forensic analysis is for all forensic analysis to be done in triplicate by three different private laboratories. All of the laboratories would be blinded to the context of the case, and only when all three agreed in their analysis, would a result be reported." What I said in the cited publication, however, was, "Subject to the constraints of feasibility, some evidence should be chosen at random for triplicate testing at different labs" (p. 21). I did not say that all evidence must be subject to redundant testing, but only a randomly chosen fraction. In referring to "the constraints of feasibility," I clearly recognized that redundant testing is not always feasible. I have never suggested restrictions on what results could be reported (to whom?) or a criterion of unanimity. In an experiment briefly described in the study Gestring cites, I allowed the subjects playing the role of jury to decide for themselves how to interpret conflicting results. I favor such liberty of interpretation for the triers of fact in our criminal justice system.

Professor Gestring may have inferred that I want triplicate testing of all evidence from another study of mine [2] in which I recommended triplicate testing for all fingerprint evidence in felony cases going to trial. That suggestion is far short of triplicate testing of all forensic evidence, however. It may be worth noting that I undertook the study to address the costs of redundancy, which I expected to be positive but worth incurring. I was able to collect a set of numbers for the year 2002 that allowed me to estimate the cost of independent, triplicate fingerprint examinations in all felony cases going to trial. To my surprise, I found that such redundancy would reduce the costs of administering the criminal justice system if the rate of false positives exceeded 0.115%, or about one in a thousand. This result is less surprising when we recognize that false positive errors are costly even when we consider only the costs of incarcerating the wrongly convicted. Forensic science is a bargain for the criminal justice system, and we need more of it.

Gestring is basically right to say, "laboratories would be blinded to the context of the case." Strictly speaking, however, it is not the laboratory, but certain examiners within the laboratory who would be shielded from domain-irrelevant information. The "case manager," (or "Evidence Control Officer") would be privy to all case information and responsible for shielding examiners from domain-irrelevant information. There is no particular reason those examiners might not work in the same lab as the case manager. Such "masking," by the way, would persist only as long as needed to discourage observer effects. In the context of DNA profiling, for example, Krane et al., [3] suggest, "After the results of the initial interpretation are documented, information about reference samples should be unmasked in a sequential manner" (p. 1006). The reference sample is not, somehow, a secret to be hidden from the examiner. Rather, procedure should require the examiner to call the alleles before viewing the reference sample. Hence, we should probably speak of "sequential unmasking" rather than "masking" or "blinding."

A part, perhaps even the core, of Gestring's objection to redundant testing comes from the recognition that, "it is possible that three separate accredited laboratories could produce different results for the same small or degraded samples." In forensic science, Gestring says, "samples are often much smaller than any commercial laboratory would accept, not always homogeneous, and often degraded. All of these factors could hinder three separate laboratories from coming to the same conclusion." I do not understand this criticism. If the differences in conclusion are large enough to influence the probative value of the evidence or its inculpatory or exculpatory significance, should we not welcome their revelation? It seems to me that Gestring has hit upon another argument favoring redundancy: Multiple tests can sometimes help us to judge how ambiguous the evidence is.

Gestring is right to note that privatization is no panacea. As I said in the study he cites, "Poorly designed 'privatization' may replace a government bureaucracy with a profit-seeking monopoly. If, however, privatization of police forensics is combined with [the other measures I have proposed], then it has considerable potential to raise standards and lower costs" (p. 28). Gestring is also right to note that it was a private lab "that deliberately withheld exculpatory results in the Duke Lacrosse case at the request of the prosecutor," a fact I have noted in the past [4]. I favor privatization, but only as the least important element of the suite of measures I have labeled "competitive self regulation."

Gestring says, "What Dr. Koppl's theory also does not take into account is that despite the scrutiny and scorn focused on laboratory based forensic science, it is not the most significant problem with forensic science today." Here again, I do not understand how the comment constitutes a criticism of my suggestions for improving forensic science. He seems to say that eyewitness testimony has a higher error rate than forensic science. "I find it hard to believe," he says, "that modern forensic labs are considered the weak link." I agree with his assessment of the relative reliability of eyewitness and forensic-science testimony. I do not understand, however, why that ranking implies that my suggestions are impracticable or undesirable. We should not rest on our laurels. The comparatively low average quality of non-forensic evidence should strengthen our resolve to improve forensic science. There is need.

I believe Professor Gestring's criticisms misfire. Nevertheless, I appreciate his article and the spirit in which it was written. His article in the last *CACNews* is a fine example of the sort of dialogue we need if we are to improve forensic science. I hope that we can learn from each other over time and, perhaps, come to a meeting of the minds on at least some important points.

I thank Dan Krane, Allan Jamieson, Michael Risinger, and Norah Rudin for comments. None of them are responsible for any errors in this reply.

Roger Koppl

- [1] "The Dawn of the 'Forensic Science Provocateur,'" *CAC News*, 1st quarter 2009.
- [2] Koppl, Roger. "CSI for Real: How to Improve Forensic Science," *Reason Foundation Policy Study* 364, 2007.
- [3] Koppl, Roger. "Romancing Forensics: Legal Failure in Forensic Science Administration," in Lopez, Edward, edited, *Government Failure in the Legal System: A Public Choice Review of the Law*, *Independent Institute*, forthcoming.
- [4] Krane, Dan, and ten others. "Sequential Unmasking: A means of Minimizing Observer Effects in Forensic DNA Interpretation," *The Journal of Forensic Sciences*, June 2008, pp. 1006-1007.
- [5] Koppl, Roger. "Defense Needs DNA, Too," *New York Post* Op-ed, 16 April 2007.

Author's Response

The successful Broadway entertainer George M. Cohan once said "I don't care what you say about me, as long as you say something about me, and as long as you spell my name right." For better or worse, Dr. Koppl has made a dramatic entrance onto the west coast. Hailed in one quarter, and as he indicates, associated with "rabble" in another. As often happens, the truth lies somewhere in between.

While I believe in Dr. Koppl's intentions, I feel he has not grasped the point of my last article [1]. For any reform to be truly successful the subtle issues need to be fully understood and accommodated. In his reply, Koppl introduces a number of areas where our views diverge. Instead of going point for point, I will focus on the issues here that best illustrate our fundamental differences.

I have previously indicated that the current accreditation process does not standardize a laboratory's limit of detection [1]. Clearly this can be a potential obstacle to duplicate or triplicate testing. Dr. Koppl seems to have taken umbrage with this observation and in his reply stated, "If the differences in conclusion are large enough to influence the probative value of the evidence or its inculpatory or exculpatory significance, should we not welcome their revelation? It seems to me that

Gestring has hit upon another argument *favoring* redundancy: Multiple tests can sometimes help us to judge how ambiguous the evidence is."

It appears, though, that multiple tests can also expose a poorly designed system of redundancy. Would it not be a more reasonable solution to involve laboratories with the same limit of detection in the duplicate or triplicate testing process?

From an economic perspective, too, it seems there would also be a financial incentive for avoiding the deliberate introduction of this level of ambiguity. In order for this system to work, a scientist will need to evaluate the duplicate or triplicate analysis results. If the system is designed to introduce ambiguity, it will take longer for each case to be reviewed and thus increase the cost of the entire process. It will also reduce the efficacy of the testing performed resulting in an inferior product that costs more.

Instead of addressing the issue head on, Dr. Koppl states that he favored "the liberty of interpretation for the triers of fact in our criminal justice system." This deeply concerns me. While there is clearly a financial impact to deliberately introducing this ambiguity, there is also an impact on our society. What factors must the jury now use to weigh this evidence? Most likely the oratory skill of the trial lawyers will factor in. Besides that, what other arbitrary factors will influence the jury's decision? Maybe the race or socioeconomic status of the suspect or victim would also play a role? Fundamentally I believe that Forensic Science should be used to mitigate all of these concerns, not aggravate them.

This issue speaks to my primary concern. The marriage between science and the law is often an ugly one. I am for both reform and the advancement of our discipline, but as the old saying goes, "the devil is in the details." I hope that this playful banter between academics will cause more forensic scientists to engage in this dialogue. You do not have to be an insider to fix the problems, but you need an insider's perspective to fully appreciate the full implications of potential solutions.

Although I continue to applaud any efforts to improve forensic science, I still believe Dr. Koppl's talents could be used to better effect. As an economist, would it not be possible to determine the cost of poor work at the crime scene? Is it not possible to conduct studies that can demonstrate to politicians that the pennies they pinch at the inception of the investigation cost hundreds, if not thousands, of dollars downstream in the criminal justice system?

In chemistry we use the term "limiting reagent" to describe the chemical that determines how far a reaction will go. In forensic science, the crime scene will always be that limiting reagent. Science, no matter how sophisticated, can rarely overcome evidence that was improperly collected or never even recognized in the first place. More often than not, scene investigators and prosecutors define our analysis and craft their own interpretations. It is surprising to me that outside reformers have neither recognized these systematic limitations of forensic science nor ever tried to improve them.

Hopefully these comments further clarify some of my earlier thoughts. New ideas are difficult to introduce. Mark Twain once said that "a person with a new idea is a crank until the idea succeeds." Dr. Koppl, I hope the forensic science community affords your ideas the vetting they need to ensure they succeed.

Brian J. Gestring

[1] "The Dawn of the 'Forensic Science Provocateur,'" *CAC News*, 1st qtr 2009.

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The Increasingly Diverse and Challenging Discipline of Trace-evidence Analysis

An exclusive *Evidence Technology Magazine* interview with

Robert D. Blackledge

Forensic Chemist, (*ret.*) Naval Criminal Investigative Service (NCIS)

EVIDENCE MAGAZINE: Trace evidence is a very broad field, isn't it? Hair, fiber, glitter, dirt, paint...

BLACKLEDGE: Yes, it is actually a very diverse field. Almost anything can be trace evidence. Some things are not called trace evidence by most people, although I could probably make an argument that they are trace evidence. For example: If you walk across a room, you are going to either leave traces of your footprints because of dust on your shoes or you are going to be picking up traces of the dust on the floor. Most people would just call that footwear impressions. But really, it is an exchange of contact trace. That's why there needs to be more emphasis on training the people who process crime scenes so they will be more aware of the possibilities—so they will be thinking of trace evidence right from the start.

EVIDENCE MAGAZINE: You have been doing this for quite awhile, right?

BLACKLEDGE: I got started in this area back in 1971. And Yes, it has changed significantly over the years! Back then, if I had an area of evidence that I did not know much about, there might have been some people I could have called. But I couldn't just sit down at



Calico Press for the CACNews

a computer and Google the topic like we all can do today to find the key references and resources that we need.

EVIDENCE MAGAZINE: How did you get started in your study of the trace-evidence discipline?

BLACKLEDGE: Actually, I spent most of my time doing drug analysis. I was with the Naval Criminal Investigative Service (NCIS) forensic laboratory in San Diego, California. But most of our military cases were adjudicated before going to court martial and requiring testimony. That's why I had time to get involved in trace evidence and do a little bit of research.

EVIDENCE MAGAZINE: Trace evidence was your specialty, wasn't it?

BLACKLEDGE: Well, trace evidence has always been my major interest in forensic science. But it was more of a sideline. In most small labs, you can't really have a full-time trace-evidence person.

So you usually end up with one person doing trace evidence part-time.

EVIDENCE MAGAZINE: From your point of view, what is one thing people need to know about trace evidence?

BLACKLEDGE: Consider this: With trace evidence, you have a questioned sample and a known sample. And you are trying to prove that the questioned sample could not have originated from the same source as the known sample. So you focus on that—because as soon as you have your proof, that particular examination is over. If you have a series of tests that you can run, you probably will want to do the easiest ones first, along with the non-destructive ones. As soon as you have a test where known and questioned are different, you have an answer to your basic question: No, it could not have come from a common source. You have eliminated at least that evidence as having any probative value with regard to that particular suspect. Of course, it might have probative value for some suspect who has not been introduced yet.

"People talk about the need for forensic scientists to be unbiased. Well, in a way we are sort of working for the suspect—or at least, for the person who has come up as a person of interest. Why? Because if we can show that the questioned sample and the known sample could not have originated from a common source, then it does not show an association between the suspect and the victim or the suspect and the crime scene."

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EVIDENCE MAGAZINE: Are you trying to clear the suspect...?

BLACKLEDGE: People talk about the need for forensic scientists to be unbiased. Well, in a way we are sort of working for the suspect—or at least, for the person who has come up as a person of interest. Why? Because if we can show that the questioned sample and the known sample could not have originated from a common source, then it does not show an association between the suspect and the victim or the suspect and the crime scene. That's the way every trace-evidence examiner works. You are trying to find a difference. And if, after you have run every test that is practical, you still have not come up with any differences that can't be explained, you say that the questioned sample could have originated from the same source as the known sample. You can't say that it did...unless you have come up with something like a fracture match or something else that proves it had to have come from that source.

EVIDENCE MAGAZINE: So you always have to keep an open mind?

BLACKLEDGE: Absolutely. We have to keep an open mind—even if it proves the person of interest is lying. Then we have to ask, “Are you lying because you committed the crime...or are you lying because you are having an affair and you are meeting your lover at some clandestine location and it's going to ruin your marriage if your spouse finds out...so you do something to hide the facts?” That is something that has to be considered: The person could be lying...but for reasons other than the crime you are investigating.

EVIDENCE MAGAZINE: So are you saying that the real probative value of trace evidence is revealing the possibility of a connection?

BLACKLEDGE: Generally speaking, it is not a single trace that is so important. It is that you have several different traces that you cannot eliminate as having come from the known source. And the more you have, the better the probability that they did, in fact, come from the known source. Someone might say, “Well, this is just circumstantial evidence.” Well, if you have enough of it, the odds of it coming from any other source are pretty small.

EVIDENCE MAGAZINE: Don't defense attorneys like to pick on you guys who work the trace evidence?

BLACKLEDGE: Yes. They do. And that points out an area that needs a lot of work in forensic science. In many cases, the statistics are not available. For example: I have done quite a bit of work on glitter evidence. The average person on the street thinks that glitter is glitter and it is all pretty much alike. But in actuality, there is a tremendous variation between glitter products. One company in New Jersey, for instance, states on its website that it has more than 20,000 varieties of glitter. With most transfers—whether it is fiber or glitter or paint or what have you—it is difficult to come up with an estimate of how rare a particular sample might be. If I just go out in the community and sit on seats in public places or ride in public vehicles, what are the odds that I would have an exchange and this type of trace evidence would be on my clothing? Right

now, it is hard to come up with even ballpark numbers. With DNA evidence, of course, you have very reliable and impressive statistical numbers. We need more research and more statistical information for items that appear as trace evidence.

EVIDENCE MAGAZINE: Isn't there any way to narrow it down?

BLACKLEDGE: You could probably go by reasoning. If you look at the more common fibers, you might have an idea of the chances of picking up those fibers in a particular color. But for a new fiber, the odds would probably be quite a bit less. Of course, you have little pockets in the logic. For some reason, a certain fiber might be quite common in one location—but in the whole region, it might be quite rare. Investigators and forensic scientists need to know the context.

EVIDENCE MAGAZINE: What do you mean by “context”?

BLACKLEDGE: Let's say you come up with a match and you're ready to testify in court. But if for some reason, your agency didn't want you to be biased, so you were just asked, “This questioned fiber and the known fiber: Do they compare? Are they alike or different?” If you have no idea of the context in which you are doing this, you might say based on all the tests you ran, “Yes, they match.” But if you knew the context, you might realize that this match is not all that unusual considering the area where the fibers were found.

EVIDENCE MAGAZINE: Please explain.

BLACKLEDGE: Let's say there is a coal-fired power plant. The soil downwind from this power plant has collected some combustion by-products that were emitted from the stack of the plant. In this scenario, the crime scene was also located downwind of the plant. Well, if you are just looking at two soil samples—one from the suspect and one from the crime scene—and you find that the traces on his shoes and in his car match those at the crime scene, then you might say, “This is really important.” But what if the suspect works and lives downwind from the power plant? In this context, it would not be unusual for the two samples to be alike. In other words, if you had known the context, you would have realized that the match really doesn't prove anything.

EVIDENCE MAGAZINE: But isn't trace evidence a key part of investigation?

BLACKLEDGE: Trace evidence can be very useful, of course. Sometimes, a person will give an alibi and the trace evidence will prove that the alibi just doesn't pan out. It will prove that the person could not have been where he claimed to have been at the time of the crime. Actually, trace evidence can work both ways: It can help to prove that you are innocent...and it can help to prove that you are lying.

EVIDENCE MAGAZINE: What is in the future for trace evidence?

BLACKLEDGE: I think the role of trace evidence cannot help but grow. Other investigative disciplines are becoming more automated and more routine—and rather uninterest-

ing. For someone who has advanced degrees and likes variety, trace evidence could really be the direction to go. Whether you are an investigator working for a police agency or a scientist working in a crime lab, trace evidence offers a wide range of intellectual challenges.

EVIDENCE MAGAZINE: Is there anything new on the horizon?

BLACKLEDGE: Well, there is one thing that I think will become more and more important in the future: stable isotope ratio mass spectrometry or IRMS. For example: Remember the anthrax scare? The white powder? By looking at the stable isotope ratios, they were able to determine that this material did not have a Middle East origin. Instead, it most likely came from the northeastern part of the United States. In doping cases with athletes, they can use the IRMS to look at the carbon-12 to carbon-13 ratio and they can tell whether testosterone from the urine sample was produced in the athlete's body or whether it came from a source outside the body. I consider that to be an example of trace evidence, even though someone else might say, "No, that is toxicology." In the future, I expect stable isotope ratio mass spectrometry to become very important in trace evidence.

EVIDENCE MAGAZINE: Does IRMS require expensive equipment?

BLACKLEDGE: Well, it requires a very specialized mass spectrometer where you are only looking at several things: carbon-13, carbon-12, oxygen-16, oxygen-18, hydrogen with a mass of one, hydrogen with a mass of two, chlorine, sulfur—and that's about it. It is very specialized, but this sort of thing is being done routinely by researchers at the university level. I think it is just a matter of time until the FBI will be doing it routinely, along with some of the larger crime labs. It will never be done by smaller crime labs, but it will be something that can be done as a service for the smaller crime labs.

EVIDENCE MAGAZINE: What would you tell someone who is thinking about a career in forensic science?

BLACKLEDGE: If they were thinking about forensic science as a career or in the early phases of their career, I would ask them to think about what kind of a future they want. So many things can be automated today. Take DNA, for example. Other than the collection of the DNA evidence at the crime scene and the initial preparation of samples for analysis, the DNA analysis part is becoming more and more automated. And that automation probably requires a technician, rather than someone who has a PhD in molecular biology. In the future, most labs will have someone with that degree and they will be in charge of the section. But there won't be very many others with that type of education. Everyone else will be a technician—and what they do will be very repetitive. To me, it would be like going to work on a factory assembly line. It won't be very exciting. But trace evidence—by its very nature—defies automation. Why? Because each case is different. Traces are different. Collection methods are different. The way you characterize trace evidence and compare your questioned sample with your known sample... Well, I just don't see

it ever being automated. Some things can be automated, but not trace evidence. To me, that is what is exciting. Every case is a mystery just waiting to be solved.

EVIDENCE MAGAZINE: Is it true that not too many agencies have people who specialize in trace evidence?

BLACKLEDGE: I can't give you any statistics, but I have read papers that said some law-enforcement agencies are eliminating their trace-evidence sections. On the other hand, I think the pendulum is starting to swing the other way. Why? Because two years ago, the NIJ and FBI co-sponsored a trace-evidence symposium that was very well attended. People from all over the world attended and gave presentations. Now, just two years later, those same two agencies are co-sponsoring another trace-evidence symposium. It will be in Clearwater Beach, Florida from August 2 through 7, 2009*. I was very pleased to learn of this national interest in trace evidence. For some time, DNA and fingerprints were getting most of the attention and trace evidence was being ignored. This new widespread interest in trace evidence is very encouraging.

EVIDENCE MAGAZINE: Thank you for speaking with us today. □

Robert D. Blackledge received his BS in chemistry from The Citadel in 1960 and his MS in chemistry from the University of Georgia in 1962. He subsequently worked in forensic science for more than 30 years, including 11 years with the U.S. Army Criminal Investigation Laboratory in Europe. His final position was senior chemist with the Naval Criminal Investigative Service (NCIS) Regional Forensic Laboratory in San Diego, California from 1989 until his retirement in 2006. Blackledge is the author or co-author of approximately 40 articles in journals and chapters in books. His interests are wide-ranging, but his special passion is trace evidence. Reports of his research in this area have been published in the FBI's Law Enforcement Bulletin; the FBI's *Crime Laboratory Digest*; *Journal of Forensic Sciences*; *Science & Justice*; *Forensic Science International*; *Forensic Science Review*; *Microgram Journal*; and *Analytica Chimica Acta*. He is the editor for *Forensic Analysis on the Cutting Edge: New Methods for Trace Evidence Analysis* (published by Wiley-Interscience in August 2007). He may be reached by e-mail: bigpurple@cox.net.

*For information about the Trace-Evidence Symposium go to www.ojp.usdoj.gov/nij/events/trace-evidence-symposium/

Steaks, Stakes and Stakeholders

SWGDM 2009: Why policy does not belong in a scientific document



*"The scientist is not a person who gives the right answers,
he's the one who asks the right questions."*

Claude Levi-Strauss, Le Cru et le Cuit, 1964

As with so many of our recent *Proceedings*, this one was conceived, argued, and written across state lines. Fortunately, no kidnapping charges were alleged. By way of disclaimer, none of our meetings actually involved *lunch*. Rather our meetings occurred over breakfasts and dinners, where, variously, quantities of caffeine and alcohol were consumed. We discovered the Three Bees independent coffee shop in San Mateo. Dinners occurred at eateries along the charming 16th street mall in Denver, during the recent AAFS meeting, the most memorable at a steak house called "The Broker," housed in the vault space of the old Denver National Bank. For the record, Norah did not order a steak.

At the AAFS meeting, Norah presented much of this material at a standards workshop organized by John Lentini. She was asked to comment on forensic DNA standards in general; it just so happened that SWGDAM 2009 was published in *Forensic Science Communications* late in 2008 (SWGDM, 2008). What had threatened to become a boring recitation of history suddenly became much more interesting. We have been following SWGDAM from the time it produced the first TWGDAM guidelines in 1998, through its DAB days around the turn of the millennium, into its current incarnation. The SWGDAM 2009 Guidelines are radically different in its scope than previous versions; in particular, much of the new material pertains to policy rather than science.

It is helpful to refer back to the words underlying the acronym: Scientific Working Group in DNA Analysis Methods. The 2003 Bylaws underscore the original scientific and methodological direction to the group:

- SWGDAM shall serve as a forum to discuss share, and evaluate forensic biology methods, protocols, training, and research to enhance forensic biology services.
- When necessary, SWGDAM shall recommend and conduct research to develop and/or validate forensic biology methods.

Nothing in there about policy. Is policy creep sort of like "analytical drift?" (see Standard 2. Definitions, Analytical procedure)

Additionally, much of the science, particularly in SWGDAM 2009, appears diluted or obscured, unnecessarily separating forensic science even further from the greater scientific community. In spite of the fact that DNA has become the gold standard for forensic science, much of the greater scientific

community, and indeed other professional communities, still regard us with some disdain as a sort of "cowboy pseudo-science." While the old refrain of "they just don't understand" contains some merit, we are equally at fault for 1) failing to adequately convey the real substantive and enduring differences imposed by the forensic setting in which we work and 2) failing to aspire with greater conviction to an academic/scientific standard, even if we can never truly attain it.

In seeking an appropriate avenue of complaint, we run into another problem eschewed by the greater scientific community, that of opaqueness, exclusivity, even secrecy. According, again, to the 2003 SWGDAM bylaws:

- "Regular [voting] members [of SWGDAM] shall serve in a representational capacity of a federal, state, or local forensic laboratory" (*additional information in brackets ours*)

While we are aware that SWGDAM, has, over the years invited non-law-enforcement member to their meeting, the group is, by definition, highly proscribed. A list of members (who comprise a working group under the auspices of a public agency, the FBI) is available from no publicly accessible source. And no names appear as actual authors of the document. This imbues the document with the perceived authority of the FBI, yet shielding the authors from accountability. Additionally, although the SWG standards are published in *Forensic Science Communications*, the on-line journal of the FBI,

Perception aside, the performance
of any physico-chemical system
can depend greatly on local
conditions—the sensitivity of
the instrument, the exact reagent
formulation, and, as any laboratory
scientist knows, the water!

it is not peer-reviewed (in the true academic sense), nor are various stakeholders outside of the group consulted in any formal fashion. In general the process is closed, even private, inviting little or no comment from independent laboratories, consultants or members of the criminal justice system. The minutes of this government-sponsored group are not publicly available.

Before we get into the details of the document, we consider not only the stated purpose of SWGDAM, but the perceived purpose of all other SWGS. From US DOJ OIG *Special Report*, The FBI DNA Laboratory: A review of Protocol and Practice Vulnerabilities: (USDOJ OIG, 2004)

"The creation of national standards for DNA analysis played a pivotal role in establishing the integrity of the DNA testing process. In addition, by adhering to these standards, DNA laboratories, including the FBI's DNAUI, have been able to attest to the validity and reliability of their DNA testing results."

Do the SWGDAM standards really allow any lab adhering to them to "attest to the validity and reliability of their DNA testing results?" No set of standards can *guarantee* either the validity (accuracy) or the reliability (reproducibility) of the results in a particular case. However, thoughtful and appropriate standards can optimize the likelihood of getting the right result. The idea that standards *guarantee* proper results perpetuates a false confidence and masks the need for more effective checks of the veracity of results.

What kinds of checks and balances can, then, maximize veracity of case results? The academic standard is, of course, can an independent scientist reproduce the results from the information provided? In forensic science, this would involve duplicate testing of the actual case sample. While this is not always possible, nor practical, it should occur much more often than it does. A recent study actually showed cost savings from replicate testing when the cost of wrongful conviction and incarceration was considered. (Koppl, 2008) The next best check of the veracity of a case result is duplicate analysis of the data. This should always be performed blind as a part of internal review. The internal technical reviewer should also perform a rigorous evaluation of whether the data support the conclusions. Both technical and administrative review should aggressively search for typographical and calculation errors; such errors can change the strength of the evidence or even the fundamental conclusion. It is certainly true that the SWGDAM standards recommend such a review; far too often, in our experience, these steps either rubber stamp the analysis, or merely check to determine if protocol was followed. Rarely is a comprehensive review of the technical merit of the case undertaken as part of the internal review process. Finally, in an ideal world, every case would be reviewed by an independent expert. Again, legal and financial impediments make this impractical, but, again, this should occur far more often than it does. Independent review would be greatly facilitated by full transparency and cooperation in providing discovery.

So what role should standards play in the actuality of confidence in casework results? In our view, standards are useful to establish a minimal infrastructure supporting quality casework. The question then becomes, do the SWGDAM 2009 standards accomplish this goal? Are they effective at directing the establishment of such an infrastructure? Additionally, we can ask if the 2009 SWGDAM standards fulfill their mandate "... to discuss, share, and evaluate forensic biology methods, protocols, training, and research ..."

To this end, it will be instructive to examine selected standards for their scientific rigor and relevance to SWGDAM's stated mandate. We will return at the end of the article to see how they did.

Standard 2 lists various definitions used throughout the document. We've selected a few upon which to comment.

"Accredited laboratory is a DNA laboratory that has received formal recognition that it meets or exceeds a list of standards, including the FBI Director's Quality Assurance Standards, to perform specific tests, by a nonprofit professional association of persons actively involved in forensic science that is nationally recognized within the forensic community in accordance with the provisions of the Federal DNA Identification Act (42U.S.C. § 14132) or subsequent laws."

The authors would have done better to just stop with the definition of an accredited laboratory rather than attempting to incorporate the definition of an accrediting body in this standard. Apart from any substantive issues, the part of the standard that attempts to address accrediting bodies comprises so many dependant clauses that it fails to have any meaning at all. If fact, (a grammarian would point out that) it sounds as if the "nonprofit professional association" is the one who will be doing the "specific tests." Perhaps the most useless of the offending clauses is: "Nationally recognized within the forensic community ..." a completely indeterminate designation. The definition of acceptable accrediting bodies is an important but separate issue. It would be better to simply refer to some other document that fully describes the requirements of accrediting bodies.

"Analytical procedure is an orderly step-by-step process designed to ensure operational uniformity and to minimize analytical drift."

This is an example of a definition that already exists outside of forensic science, "An analytical procedure is an orderly step-by-step process." The extraneous wording, "... designed to ensure operational uniformity and to minimize analytical drift,"¹ only emphasizes the cookbook nature of many forensic protocols and invites characterization of forensic analysts as button-pushing technicians lacking the ability, and certainly the permission, for independent thought.

Some other definitions, such as those for "analyst," "audit," and "laboratory," suffer from similarly tortured verbiage.

Genetics is the study of inherited traits, genotype/phenotype relationships, and population/species differences in allele and genotype frequencies.

This is a particularly egregious definition guaranteed to offend at least the geneticists. Why do we need to make up a stilted definition for a field of study that has been in existence for centuries? Any standard genetics textbook could have been consulted for a accepted definition. For example: "*Genetics is the study of genes at all levels from molecules to populations*" (Griffiths, et al., 1993)²

Internal validation is the accumulation of test data within the laboratory to demonstrate that established methods and procedures perform as expected in the laboratory.

1 The term "analytical drift" appears to have been co-opted from clinical protocols, where submitted samples are of uniform quality and quantity, the question is the same for all tests, and each and every test is required to be conducted in an identical fashion.

2 This is just one textbook that happened to be on Norah's bookshelf. Many others would provide a similar definition.

This is an example of one of the worst functional perversions of a definition by forensic science. Validation, in general, is understood by the greater scientific community to establish the capabilities and limitations of a procedure. The fact that forensic laboratories in general, and forensic DNA laboratories in particular, treat internal validation as simply a *demonstration of expectation* greatly reduces the utility of the exercise for the laboratory. The lack of exploration of the idiosyncrasies and boundaries of a new test system regularly manifests itself in difficulties with the interpretation of compromised or complex casework samples.

Ownership occurs when any of the following criteria are applicable:

- (1) *the originating laboratory will use any samples, extracts or any materials from the vendor laboratory for the purposes of forensic testing (i.e. a vendor laboratory prepares an extract that will be analyzed by the originating laboratory);*
- (2) *the originating laboratory will interpret the data generated by the vendor laboratory;*
- (3) *the originating laboratory will issue a report on the results of the analysis; or*
- (4) *the originating laboratory will enter or search a DNA profile in CODIS from data generated by the vendor laboratory.*

This is our first example of what appears to be a purely reactive standard that has been added for the first time to the current document. To the outsider, it appears completely nonsensical and self-referential. One can only surmise that a dispute arose over “ownership” of some sample or derivative between a government laboratory and some private laboratory to which they had outsourced samples. Indeed, it is difficult even to understand the concept of “ownership” of genetic samples, an issue that continues to be debated amongst both scientists and civil libertarians. We suspect that this standard may have been inspired by a specific situation. If that is true, it is a poor basis for a general standard.

Proficiency testing is a quality assurance measure used to monitor performance and identify areas in which improvement may be needed.

Proficiency testing, as it is currently practiced among the forensic community in general, and the forensic DNA community in particular, is only a weak indicator of analyst competence. Most proficiency tests are so simple that they are considered trivial by the greater scientific community. They measure only the most basic ability of an individual to correctly analyze the simplest of samples. It is not surprising that the errors most commonly detected by proficiency test failures are typographical or calculational. The current proficiency testing scheme is a poor tool with which to identify areas in which improvement may be needed.

Work product is the material that is generated as a function of analysis, which may include extracts, amplified product and amplification tubes or plates as defined by the laboratory.

This is also a definition new to this version, for which, at least to the outsider, no obvious need exists. Of concern is that “work product” has a very specific *legal definition* that limits the dissemination of information beyond the two parties involved in a professional-client relationship. The attempt to re-define a term already established in the very arena in which we practice (law) is bad form. Two definitions by different professions working within the criminal justice system is bound to create confusion. One is left to wonder if this stan-

dard is the beginning of a trend toward even more restrictive discovery policies. That would be a shame.

Standard 5 addresses personnel issues.

Standard 5.1.3.1.2 If the continuing education is conducted externally, the laboratory shall maintain documentation of attendance through a mechanism such as certificates, program agenda/syllabus, or travel documentation. Attendance at a regional, national or international conference shall be deemed to provide a minimum of 8 hours of continuing education. [emphasis ours]

This is another example of a standard that invites criticism from the greater scientific community. First, the idea of giving formal credit for simply attending a conference, requir-

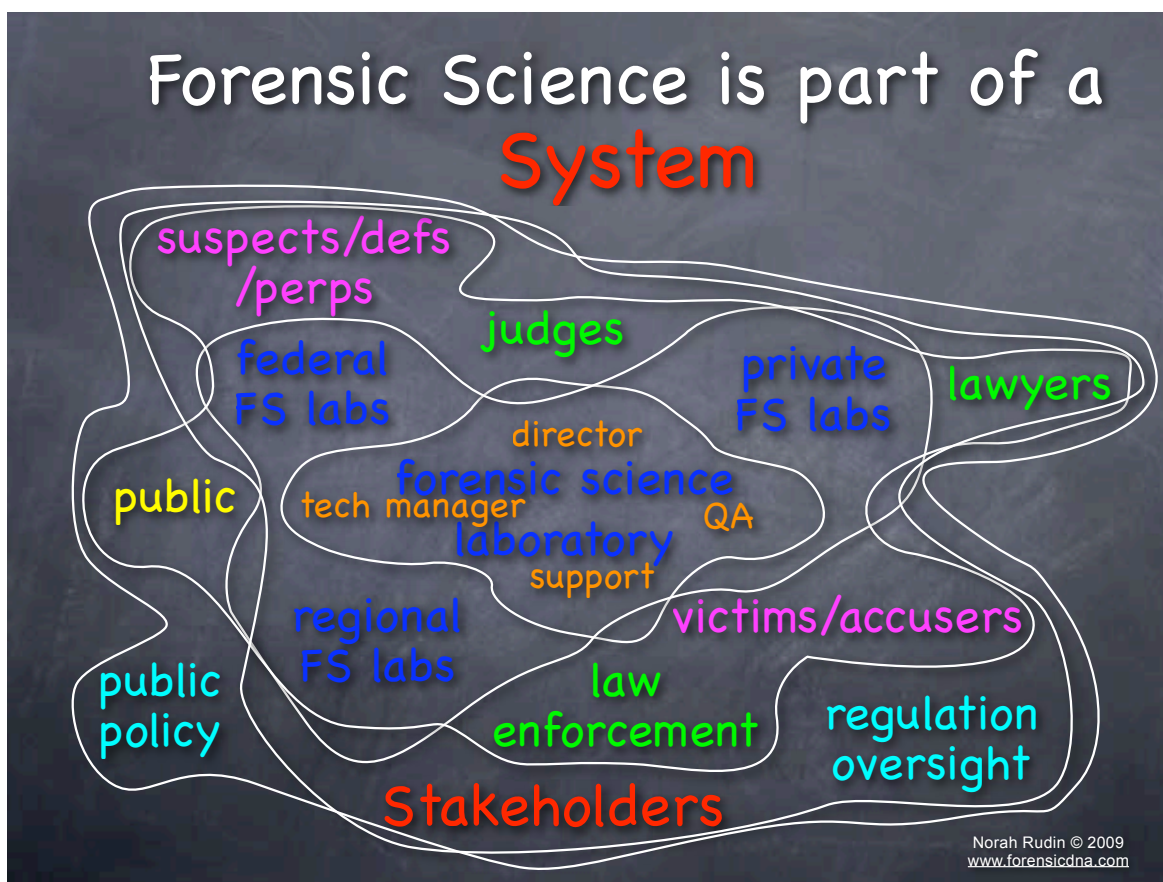
This standard encompasses the most pressing issue in forensic DNA typing today. We would like to see an open multidisciplinary working group convened, including representatives from various stakeholder groups, to address the interpretation of complex samples.

ing no documentation that the individual actually learned anything, or even attended specific sessions, is questionable. How does anyone know that we didn't spend the conference at the bar? (although, admittedly, some very useful conversations happen there) Among academicians, attendance at conferences is simply considered obligate professional development. Arbitrarily assigning 8 hours of credit for any conference attendance just adds insult to injury.

Standard 8 addresses validation.

Standard 8.3.1.1 Internal validation data may be shared by all locations in a multi-laboratory system.

While this has been the *de facto status quo* in at least some multi-laboratory systems for years, it calls into question the very purpose of internal validation. It is also a very slippery slope. This type of unnecessary and ill-recommended compromise provides yet another opportunity for the naysayers to criticize the rigor of forensic science. In most cases, the manufacturer performs a *pro forma* validation addressing all of the standard issues: reproducibility, sensitivity, mixtures, etc. Why then, does the forensic laboratory need to do any validation at all? How is this different than the central laboratory in a multi-laboratory system performing the validation for all the regional labs in the system? Perception aside, the performance of any physico-chemical system can depend greatly on local conditions—the sensitivity of the instrument, the exact reagent formulation, and, as any laboratory scientist knows, the water! In addition, a very important purpose of validation is for the scientists who will be performing the analyses to familiarize themselves with the capabilities and limitations of the system, especially the idiosyncrasies. This very important opportunity is lost if internal validation is somehow “transferable” between laboratories. Nothing can substitute for running lots and lots of samples and looking at lots and lots of data to become comfortable with a new system.



While perhaps expedient in the short term, this new standard will surely cause regret down the road.

Standard 8.3.2 Internal validation shall define quality assurance parameters and interpretation guidelines, including as applicable, guidelines for mixture interpretation.

Would that this were actually true! Having reviewed many laboratory validation studies and interpretation guidelines, we have rarely seen guidelines that derive from a quantitative analysis of validation data. In the vast majority of cases, guidelines are simply a grandfathered policy based on what other labs are doing, or a historical misunderstanding of a manufacturer's recommendation that was never intended as such. Frequently laboratories will import their previous interpretation guidelines almost wholesale when a new kit is implemented. Rarely is validation sufficiently extensive to support the sort of rigorous quantitative analysis that could lead to robust interpretation guidelines. Interpretation of compromised and complex samples, and subsequent estimation of the weight of such evidence, is of foremost concern in forensic DNA analysis today. A much larger and varied data set is needed, both from individual laboratories and the collective forensic science community, to better address the interpretation and statistical weight of marginal samples. This is one area where the forensic community could benefit greatly from a closer relationship with academia. While some relationship undoubtedly exists, it is unclear from this standard exactly how internal validation should define quality assurance parameters.

Standard 9 addresses analytical procedures.

Standard 9.5.2 1. Positive and negative amplification controls

associated with samples being typed shall be amplified concurrently with the samples at all loci and with the same primers as the forensic samples. All samples typed shall also have the corresponding amplification controls typed

Standard 9.5.3 Reagent blank controls associated with each extraction set being analyzed shall be: ...

[Standard 9.5.3.2] Amplified utilizing the same primers, instrument model and concentration conditions as required by the sample(s) containing the least amount of DNA; and

[Standard 9.5.3.3] Typed utilizing the same instrument model, injection conditions and most sensitive volume conditions of the extraction set

Lest you get the impression that our only comments of the new standards are negative, the above represents several related examples that show a welcome trend toward procedures accepted in the scientific community at large. We recollect one audit report in which the inspectors apparently were unaware of the scientific dictum that requires controls to be treated in the same manner as test samples (Rudin and Inman, 2005) This standard is a constructive improvement.

Standard 9.6. The laboratory shall have and follow written guidelines for the interpretation of data.

Standard 9.6.4. Laboratories analyzing forensic samples shall have and follow a documented procedure for mixture interpretation that addresses major and minor contributors, inclusions and exclusions, and policies for the reporting of results and statistics.

This is also an excellent standard, and it will be interesting to see how laboratories respond to and implement it. Many current interpretation guidelines are woefully vague on these

Proceedings of Lunch

issues, either simplifying the interpretation guidelines to the point where they are worthless or providing so much latitude that the guidelines are effectively pointless. This standard encompasses the most pressing issue in forensic DNA typing today. We would like to see an open multidisciplinary working group convened, including representatives from various stakeholder groups, to address the interpretation of complex samples.

Standard 11 addresses reports.

Standard 11.1. The laboratory shall have and follow written procedures for taking and maintaining casework notes to support the conclusions drawn in laboratory reports. The laboratory shall maintain all analytical documentation generated by analysts related to case analyses. The laboratory shall retain, in hard or electronic format, sufficient documentation for each technical analysis to support the report conclusions such that another qualified individual could evaluate and interpret the data

We wholeheartedly agree with this standard, with one modification and one addition. This modification is that the data absolutely must be maintained in electronic format, no exceptions, no excuses. Only electronic data can be viewed at different scales to best distinguish between an authentic allele and an artifact in low level or noisy data. And only electronic data can be reanalyzed using different parameters if desired at some future date. We are aware of only one laboratory that historically did not maintain electronic data. That laboratory changed its policies some years ago; however, the lack of electronic data has created ongoing problems for cases just now coming to trial, including the expense, time, and consumption of evidence to retest samples either for legal or scientific reasons. There is no plausible or supportable reason to discard electronic data.

The addition is that, not only should all data and documentation be retained, as described and discussed above, it should be made available upon request to any qualified expert retained by the prosecution, defense, or the court. The reason is clearly provided in the last sentence of the standard: "... such that another qualified individual could evaluate and interpret the data." Again, no plausible or supportable reason exists to withhold any part of the data or laboratory documentation from an expert working on behalf of any involved party. We are pleased to observe a general trend toward transparency in many of the labs we work with; however, certain laboratories continue to treat the independent review process like some sort of live chess match, gambling liberty or even lives, on a contest of wits. This is unprofessional and irresponsible.

Standard 11.3 Except as otherwise provided by state or federal law, reports, case files, DNA records and databases shall be confidential.

Standard 11.3.1 The laboratory shall have and follow written procedures to ensure the privacy of the reports, case files, DNA records and databases.

Standard 11.3.2 The laboratory shall have and follow written procedures for the release of reports, case files, DNA records and databases in accordance with applicable state or federal law.

Standard 11.3.3 Personally identifiable information shall only be released in accordance with applicable state and federal law.

This would seem to be a direct response to the repeated and increasingly insistent calls for dissemination of DNA databases for research purposes. Obviously, when any genetic database is disseminated, it is appropriate to strip it of personal identification information. However, once it is anonymized, no

reason exists to withhold it from qualified researchers. We are further intrigued by the labeling of the data as "confidential." Whose confidentiality is being protected, if in fact such a concern legitimately exists? And who is ultimately the keeper of the confidentiality? Who decides? Who arbitrates? What legal standard is being invoked? We are further concerned that the labeling of case information as "confidential" will simply provide an additional basis for certain jurisdictions to withhold legitimate discovery when requested by a legitimate legal party.

Standard 12 addresses review.

Standard 12.2. Completion of the technical review shall be documented and the technical review of forensic casework shall include the following elements:

Standard 12.2.1 A review of all case notes, all worksheets, and the electronic data (or printed electropherograms or images) supporting the conclusions.

Have we learned nothing from the lessons of (then) Cellmark, the FBI, and other laboratories where rogue analysts were forging data in a way that was not detectable without reviewing the electronic data? In any case, the greatest independence of internal review is achieved by reanalyzing electronic data. Printed electropherograms are not data, they document decisions made about data; thus a truly independent review cannot be accomplished from printed documents.

Standard 14 addresses corrective action.

Standard 14.2. Corrective actions shall not be implemented without the documented approval of the technical leader.

This new standard seems innocuous, even reasonable, until we think about it in the context of the quality system described in Standard 3. New wording at the end of that standard reads:

Standard 3.3 The quality system as applicable to DNA shall be reviewed annually independent of the audit required by Standard 15. The review of the quality system shall be completed under the direction of the technical leader and the approval by the technical leader shall be documented.

This creates an interesting tension between the quality manager and the DNA technical lead. Which one is actually responsible for the quality system of the DNA unit? And which one has ultimate veto power? From the preceding standards, it sounds like the DNA manager can trump the laboratory QA manager. This removes an important external check on the system, especially if the DNA manager also performs casework. It seems counter-intuitive to a good systems approach, which makes us wonder what stand-off between a DNA technical leader and a QA manager led to these standards. And, what of the other sections of the lab? If each supervisor or section manager must approve corrective actions within her section, this would seem to greatly reduce the effectiveness of the QA manager.

We could go on. But you get the idea. The 2009 SWGDAM standards contain a number of changes from the previous 2000 DAB version. From our perspective, the changes do not elevate the operative standards of the laboratory. Conversely, they appear to be reactive and protective. In many cases, the additional verbiage appears nonsensical to someone who was not directly involved in the discussions that generated the wording.³ Further, we would opine that SWGDAM

³ While the document sorely requires the services of a good copy-editor, this is only part of the problem.

has exceeded its original mandate. The document has clearly strayed into the domain of policy, which only serves to dilute and undermine the technical content. A number of issues would best be referred to a multidisciplinary oversight body comprised of stakeholders with vested interests.

Unfortunately, the direction that the standards have taken not only fail to elevate the discipline of forensic DNA analysis, and our profession in general, they provide yet more unnecessary fodder for our critics. Especially in light of the recent NAS report, we need to think carefully about the direction we want to take in the future.

In the meantime, we are really looking forward to that next libation.

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Koppl, R., Kurzban, R., and Kobilinsky, L., Epistemics for Forensics, *Episteme: Journal of Social Epistemology*, 5(2), 2008.

Rudin N., and Inman, K., A Hitchhiker's Guide to Accreditation, *CACNews* 3rd Quarter 2005.

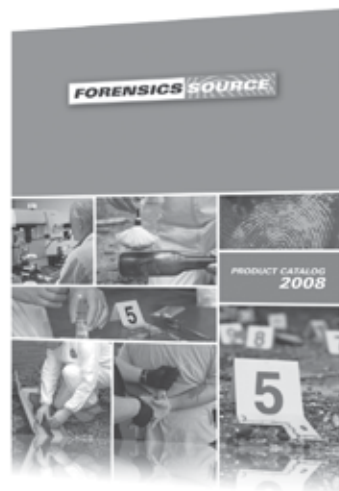
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Acronyms:

AAFS	American Academy of Forensic Science
DAB	DNA Advisory Board
DNAUI	DNA Unit I
FBI	Federal Bureau of Investigation
OIG	Office of the Inspector General
QA	Quality Assurance
SWG	Scientific Working Group
SWGDM	Scientific Working Group in DNA Analysis Methods
TWGDAM	Technical Working Group in DNA Analysis Methods
USDOJ	United States Department of Justice

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Part I of a Series:

Forensic Photoshop Cheat-Sheet

Luminol Overlays



Capture two flash images, one before and one after capturing the luminol image. This way, if the image hasn't shifted between the two flash photos, you have photographic support that the luminol overlay is accurately placed.



Luminol Image



Use a tripod and banish voyeurs (their presence increases the risk that the tripod will get kicked).



Blended layers

*Use Photoshop version CS2 or higher. These versions can document each of your steps in a History File. Make sure the History File is recording before you work on your image by doing the following:

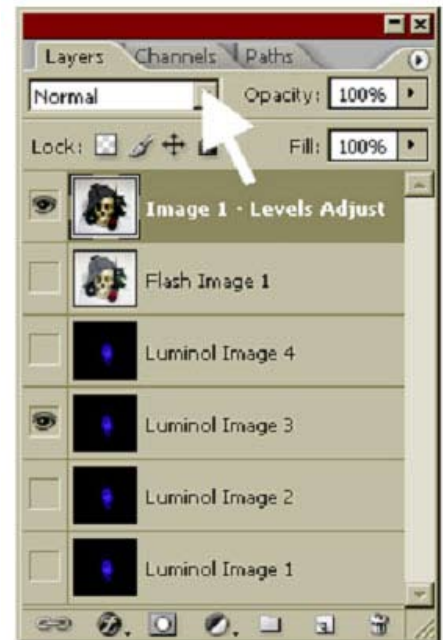
- Click on Edit > Preferences > General
- In the window, check History Log and choose Metadata.
- To view the History File, click on File > File Info.... In the window highlight History. The log can be viewed on the right side of the window. One way to get a print-out is to highlight the log and cut-and-paste it into a text editor.

For more information, check local colleges for a basic Photoshop course to become familiar with the software (some colleges offer on-line courses, such as Grossmont College in San Diego). Foray Technologies offers week-long forensic digital imaging classes utilizing Photoshop. Check their website for upcoming classes: www.foray.com/index.php.

—Carolyn Gannett

In Photoshop:*

- Load luminol and flash images into separate layers.
- Make the two layers to be blended the only ones active (in the Layers palette, click in the box to the left of each layer--an eye means it's active).
- Make current (highlight) one of these two layers by left-clicking on the layer's name.
- In the Layers Palette, click on the drop down menu at the top.
- Click on a blending option in the drop down menu. Try each of them to determine which one gives you the best blended image. The order of the layers can sometimes affect the blending.
- The result can be saved as a JPG



President's Desk, *cont'd*

The CAC By-Laws states in Section 1: Foster an exchange of ideas and information within the field of criminalistics and Section 3: Encourage and, if possible, financially support worthy research projects. The By-Laws were amended by the membership on October 7, 1955. The A. Reed and Virginia McLaughlin Endowment fund has supported numerous research projects and training events over the past several decades. Additionally, the dissemination of research and new information is encouraged at CAC Seminars. This illustrates our membership's dedication to the advancement of the field. Again, it is our responsibility to continue this deep seated tradition and be proactive in the continuing education and research in the criminalistics field as identified in Recommendation 10 in the NAS report.

Recommendation 10:

To attract students in the physical and life sciences to pursue graduate studies in multidisciplinary fields critical to forensic science practice, Congress should authorize and appropriate funds to the National Institute of Forensic Science (NIFS) to work with appropriate organizations and educational institutions to improve and develop graduate education programs designed to cut across organizational, programmatic, and disciplinary boundaries. To make these programs appealing to potential students, they must include attractive scholarship and fellowship offerings. Emphasis should be placed on developing and improving research methods and methodologies applicable to forensic science practice and on funding research programs to attract research universities and students in fields relevant to forensic science. NIFS should also support law school administrators and judicial education organizations in establishing continuing legal education programs for law students, practitioners, and judges.

The CAC will continue its leadership role in criminalistics and be proactive on the remaining recommendations of the NAS report. Response to the NAS recommendations will be forthcoming.



¹Barnett, P., Certification Programs for Criminalists— Historical Development, *Forensic Science Review* Vol 20 No 1 Jan. 2008 pp19-43.

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Joint meeting with the California Association of Criminalists
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Autumn: 30 October – 1 November, The Majestic Hotel, Harrogate
'R-Evolution: What Goes Around Comes Around'

October 31, The Majestic Hotel, Harrogate
Golden Jubilee Ball: Champagne Reception, Dinner, Dancing,
Prizes and Entertainment

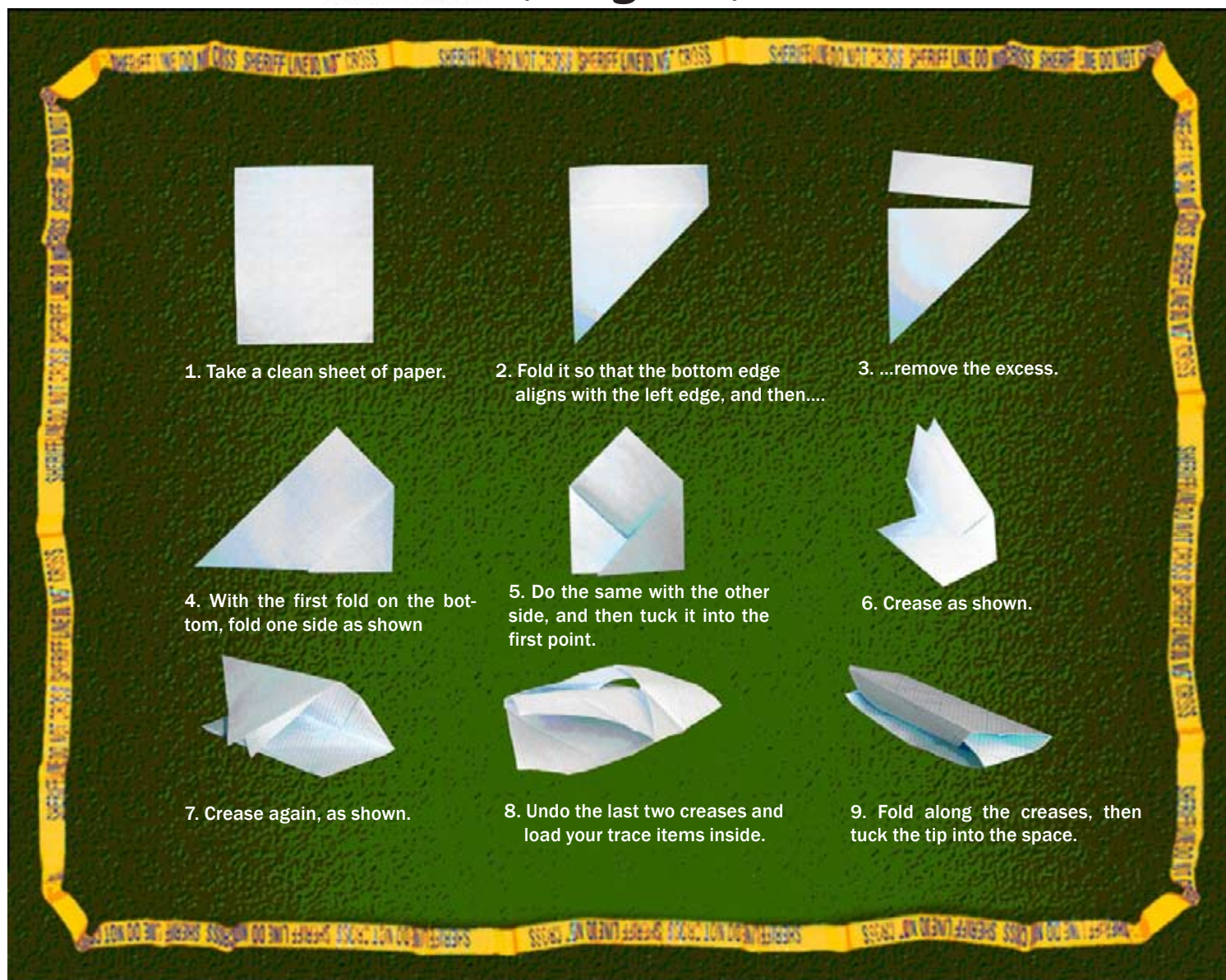
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* Or, How to Fold a Paper Bindle

I Don't Need No Stinkin' Ethics Code!

By Carolyn Gannett

One of our colleagues in the forensic community is on record as having said,

"Unfortunately ethics is not something that can be learned. You either are an ethical person or you're not!" If this were true, then it would be a waste of time to read any code of ethics.

Let me add to that record: I heartily and profoundly disagree with this colleague! Maybe some people are born or develop without a sense of good and bad, and maybe that sense can never be learned. I don't know—ask a psychologist. Regardless, such people should still be capable of learning a set of rules and their consequences. You don't have to have to be an honorable person of high moral character to understand that if you kick your neighbor upside the head you could wind up in jail.

Codes of ethics (rules, standards, or codes of professional conduct, etc.) are similar to laws—they're a set of rules that, typically, have consequences if you break them. If you're in the United States, you should know its laws and their consequences in order to keep out of trouble. If you're in the forensic sciences, you should know the codes of ethics under which you practice and the consequences for violating them in order to keep out of professional trouble.

At the minimum, it would behoove the forensic practitioner to know the code of ethics for each association to which he or she belongs. But this may not be enough. There are many different codes—each association has its own version, and its reach is only as far as that association's membership. Perhaps an association that you don't belong to lists important concepts in its code of ethics that could help you in your day-to-day practice—concepts that are lacking in your own associations' codes. Also, how can you fairly judge the behavior of a colleague, who belongs to associations that you don't, if you are ignorant of the code under which your colleague is practicing? Just because your colleague's behavior might be deemed unethical by your own association doesn't mean it would be deemed unethical by his association.

Below is a spreadsheet that summarizes the content of twenty bench-level forensic science associations' codes of ethics. Included are regional, national (US, Canada, UK, Australia/New Zealand), and international associations. It serves as a ready reference for the following:

- A comprehensive listing of specific behaviors valued by the forensic community,
- A reference to evaluate potentially unethical behavior of colleagues,
- A reference for comparison of the content of different associations' codes, and
- Groundwork for better ethics codes.

Bear in mind that sorting ethical concepts into a spreadsheet is subjective. If a hundred people were asked to create a similar spreadsheet, you'd probably get a hundred different versions. This spreadsheet is provided only as a quick refer-

ence. Use it with care: concepts are paraphrased and categorizations are subjective. Always refer to the original documents for precise wording, context, and meaning.

I didn't set out to find certain principles and concepts. I simply took what I found and sorted it. My intent was to include every concept that I encountered. Orange highlights in the spreadsheet indicate ten primary principles that I found: be objective; be honest; be forthright; be conservative; be current; be fair; communicate precisely, accurately, and clearly; do proper tests; be confidential; and be responsible. Some of the principles have sub-principles, which are indicated by yellow highlights. For example, under "Be Honest" there are three categories into which concepts regarding honesty fell: be honest about your qualifications, in reports, and regarding association business.

The entries in white are concepts in which I've paraphrase wording from the codes. For anyone who's a die-hard forensic ethics geek like me, I can provide a 32-page version of the spreadsheet that lists under each concept the exact wording and reference from each code that I believe expresses the concept.

As an example of one use of the spreadsheet, we can examine the question: "Is it unethical not to read and understand the implications of your association's ethics code?" Each row in the spreadsheet is assigned a number (see the far left side) to facilitate discussion. Check out the concept in row #132: "Read the code of ethics and be aware of its implica-

...how can you fairly judge the behavior of a colleague, who belongs to associations that you don't, if you are ignorant of the code under which your colleague is practicing?

tions." Now, continue along this row to the right and find the Xs. There's only one—under the SWAFS column. This means that SWAFS, in my opinion, states this concept in their code of ethics. So, SWAFS might consider the answer to be "Yes—you ARE unethical not to read the association's ethics code." In a serious situation, you'd want a definitive answer—you should go to the SWAFS code of ethics and see exactly how this concept is worded and in what context.

Note that no other associations have Xs in this row. Does this mean that their answer would be, "No"? Look at rows #127-131; each falls under the sub-principle "Promote Ethical Behavior." It could be argued that ethical behavior cannot be promoted if you don't even know how it's defined. If so, then any association with an X under this sub-principle might answer, "Yes" to the question. Note that this includes almost every association on the spreadsheet. The total number of associations that adhere to each concept is listed in the far right column.

So, it appears that the consensus in the forensic community is that practitioners should read the codes of ethics of the associations to which they belong. Maybe it's a good idea to pull the code from each association to which you belong

Please turn to page 28

Presented at the Spring, 2008 CAC Seminar in San Diego.

Survey: Ethics Codes Related to Forensic Science

C. M. Gannett, February 2009

BE OBJECTIVE (Refers to actions & mindset WRT analyses & reporting.
FAIR refers to interactions with others.)

Be objective (unbiased, impartial).

Be inquiring.

Have a truly scientific spirit.

Have an open mind.

IN ANALYSES

Objectively assess evidence.

Thoroughly examine the facts.

Use the principles of science (be logical) when doing an analysis or examination.

IN REPORTING RESULTS

Don't slant conclusions (be impartial, unbiased, independent, balanced, objective, don't give greater weight to an opinion than is due).

Base conclusions only on facts.

Don't assist contestants through tactics that will implant a false impression.

Be aware of the implications of opinions and conclusions and be prepared to weigh them.

Consent to interviews with counsel for both sides prior to trial.

Be prepared to reconsider and, if necessary, change your advice, conclusions, or opinion.

BY AVOIDING POTENTIAL CONFLICTS OF INTEREST

Don't render services on a contingency basis.

Don't offer or accept bribes.

Don't use your membership in the association to get unjustified benefits, privileges, or exemptions.

Disclose any conflicts of interest.

Do nothing to imply a conflict of interest.

BE HONEST

Be honest.

ABOUT YOUR QUALIFICATIONS

Don't lie about your experience.

Don't lie about your training.

Don't lie about your area of expertise.

Don't lie about your qualifications.

Don't lie about your education.

Don't associate your name with developments, publications, or organizations

IN REPORTS

Don't lie about data used to support conclusions.

Don't lie in reports or testimony.

Don't lie about scientific principles used to support conclusions.

	AAFS	ABC	ABFDE	ACSR	AFTE	ANZFSS	ASQDE	CAC	CSFS	ENFSI	FSS-UK	IABPA	IAI**	MAAFS	MAFS	NEAFS	NWAFS	RMABPA*	SAFS	SWAFS	Total
Be objective (unbiased, impartial).			X		X	X	X	X		X		X					X	X			9
Be inquiring.								X									X				2
Have a truly scientific spirit.								X									X				2
Have an open mind.															X						1
IN ANALYSES																					
Objectively assess evidence.		X	X	X	X				X				X	X						X	8
Thoroughly examine the facts.					X		X	X						X			X			X	6
Use the principles of science (be logical) when doing an analysis or examination.			X				X	X									X				4
IN REPORTING RESULTS																					
Don't slant conclusions (be impartial, unbiased, independent, balanced, objective, don't give greater weight to an opinion than is due).					X	X		X	X	X				X	X	X	X			X	10
Base conclusions only on facts.		X			X		X		X					X	X					X	7
Don't assist contestants through tactics that will implant a false impression.					X			X									X				3
Be aware of the implications of opinions and conclusions and be prepared to weigh them.		X			X			X									X				3
Consent to interviews with counsel for both sides prior to trial.		X				X															2
Be prepared to reconsider and, if necessary, change your advice, conclusions, or opinion.										X											1
BY AVOIDING POTENTIAL CONFLICTS OF INTEREST																					
Don't render services on a contingency basis.		X	X		X	X	X	X	X					X	X		X			X	11
Don't offer or accept bribes.						X							X	X		X					4
Don't use your membership in the association to get unjustified benefits, privileges, or exemptions.														X		X					2
Disclose any conflicts of interest.										X											1
Do nothing to imply a conflict of interest.												X									1
BE HONEST																					
Be honest.										X			X								2
ABOUT YOUR QUALIFICATIONS																					
Don't lie about your experience.	X		X	X								X		X		X				X	7
Don't lie about your training.	X		X	X								X		X		X					6
Don't lie about your area of expertise.	X		X	X										X		X				X	6
Don't lie about your qualifications.		X			X				X			X	X								5
Don't lie about your education.	X		X	X								X								X	5
Don't associate your name with developments, publications, or organizations						X		X									X				3
IN REPORTS																					
Don't lie about data used to support conclusions.	X		X	X								X									4
Don't lie in reports or testimony.																				X	1
Don't lie about scientific principles used to support conclusions.	X																				1

REGARDING ASSOCIATION BUSINESS

Don't lie on the association's membership application form.

Don't lie about your membership status in an association.

Don't lie to the association board or its representative(s).

Don't illegally issue or receive the association's certificates of competency.

BE FORTHRIGHT

Evidence may be re-examined by another analyst.

Ensure that a full and complete disclosure of findings is made to the submitting agency.

Be forthright in all aspects of criminal, civil, and departmental matters.

Disclose any errors or omissions discovered before, during, or after any hearing.

Tell the client and employer promptly of any change in your advice, conclusions, or opinion.

Disclose to your employer any pressure to influence your results.

REGARDING SCRUTINY OF YOUR WORK

Be open to scrutiny of your work.

Make supporting documents at the time the work is done and preserve them appropriately.

State in your report all items examined or tested.

BE CONSERVATIVE

Do not extend yourself beyond your area of expertise (your own limitations).

Recognize your own limitations.

Don't seek publicity for your work in a case (or accomplishments).

Don't apply new knowledge without adequate training and experience.

Don't give greater weight to an opinion than is due.

Don't offer opinions to which you've not given formal consideration.

Don't use unduly sensational means of conveying information to the court.

Be critical of untried or unproved methods.

Recognize that membership in the association does not mean competence.

Make conservative statements.

Realize that certain questions cannot be answered.

BE CURRENT

Keep abreast of new developments.

Improve your knowledge, skills, and abilities.

Make technically correct statements.

View new developments with an open mind.

Liaison with other experts.

BE FAIR (Refers to interactions with others. OBJECTIVE refers to actions & mindset WRT analyses & reporting)

Charge a reasonable fee for services, if appropriate.

Resolve conflicts prior to trial, if possible, should your results conflict with another expert's.

Act in good faith when advising attorneys in the interrogation of another expert.

Treat colleagues with due respect.

	AAFS	ABC	ABFDE	ACSR	AFTE	ANZFSS	ASQDE	CAC	CSFS	ENFSI	FSS-UK	IABPA	IAI**	MAAFS	MAFS	NEAFS	NWAFS	RMABPA*	SAFS	SWAFS	Total
Don't lie on the association's membership application form.		X										X				X					3
Don't lie about your membership status in an association.	X											X	X								3
Don't lie to the association board or its representative(s).		X																			1
Don't illegally issue or receive the association's certificates of competency.	X																				1
BE FORTHRIGHT																					
Evidence may be re-examined by another analyst.					X	X	X							X	X		X			X	7
Ensure that a full and complete disclosure of findings is made to the submitting agency.	X								X							X					3
Be forthright in all aspects of criminal, civil, and departmental matters.												X									1
Disclose any errors or omissions discovered before, during, or after any hearing.					X																1
Tell the client and employer promptly of any change in your advice, conclusions, or opinion.										X											1
Disclose to your employer any pressure to influence your results.										X											1
REGARDING SCRUTINY OF YOUR WORK																					
Be open to scrutiny of your work.					X	X	X							X	X		X				6
Make supporting documents at the time the work is done and preserve them appropriately.	X					X			X												3
State in your report all items examined or tested.					X																1
BE CONSERVATIVE																					
Do not extend yourself beyond your area of expertise (your own limitations).	X	X			X	X	X	X	X	X	X		X	X	X		X			X	13
Recognize your own limitations.					X		X		X					X		X	X			X	7
Don't seek publicity for your work in a case (or accomplishments).					X		X							X	X		X				5
Don't apply new knowledge without adequate training and experience.					X		X										X				3
Don't give greater weight to an opinion than is due.					X		X										X				3
Don't offer opinions to which you've not given formal consideration.					X		X										X				3
Don't use unduly sensational means of conveying information to the court.					X		X										X				3
Be critical of untried or unproved methods.					X		X										X				3
Recognize that membership in the association does not mean competence.									X				X								2
Make conservative statements.							X														1
Realize that certain questions cannot be answered.							X														1
BE CURRENT																					
Keep abreast of new developments.					X		X	X	X	X	X		X	X	X		X			X	11
Improve your knowledge, skills, and abilities.					X		X	X	X			X	X	X	X		X	X		X	11
Make technically correct statements.							X					X		X		X		X			5
View new developments with an open mind.					X			X									X				3
Liaison with other experts.												X									1
BE FAIR (Refers to interactions with others. OBJECTIVE refers to actions & mindset WRT analyses & reporting)																					
Charge a reasonable fee for services, if appropriate.	X	X					X	X	X					X	X		X			X	9
Resolve conflicts prior to trial, if possible, should your results conflict with another expert's.					X			X						X	X		X			X	6
Act in good faith when advising attorneys in the interrogation of another expert.					X			X						X	X		X				5
Treat colleagues with due respect.	X				X				X												3

Survey: Ethics Codes

Be fair.

Recognize honest differences of opinion occur.

COMMUNICATE PRECISELY, ACCURATELY, AND CLEARLY

Communicate in a clear, straight-forward manner.

Avoid misleading language.

Clearly differentiate which of your statements are scientific results and which are expert opinion.

Prepare court exhibits or tutorials according to accepted procedures; they should be informative and not misleading.

Fully explain results and conclusions, including qualifications and limitations.

If, when testifying, you are told to answer "yes" or "no," but the answer requires qualifications, say so before answering.

DO PROPER TESTS

Use methods that are generally accepted.

Don't use methods proved inaccurate or unreliable.

Do enough tests to prove the conclusion (apply a sufficient number of tests to reach conclusions).

Use validated methods.

Don't do superfluous tests to give an opinion more weight.

You may use a novel method when a particular investigation requires it.

Recognize superior methods.

Use methods that are reproducible.

MATERIALS

Use appropriate standards and controls.

Use appropriate (reliable) materials.

Determine whether evidence had significantly changed before you.

You may conduct inadequate tests on evidence, but the inadequacies must be kept in mind when forming conclusions.

EQUIPMENT & FACILITIES

Use appropriate equipment.

Document any case in which surrounding circumstances seriously restrict an adequate examination.

VERIFICATION & REVIEW

Verify your results.

Have your work that is beyond your experience reviewed by someone who has adequate knowledge in the area.

If possible, have your interpretations peer reviewed by another voting member of the association.

BE CONFIDENTIAL

Do not inappropriately disclose confidential information.

AAFS	ABC	ABFDE	ACSR	AFTE	ANZFSS	ASQDE	CAC	CSFS	ENFSI	FSS-UK	IABPA	IAI**	MAAFS	MAFS	NEAFS	NWAFS	RMABPA*	SAFS	SWAFS	Total
						X														1
					X															1
	X			X	X		X	X					X	X	X	X			X	10
	X			X		X	X			X			X	X	X	X			X	10
				X	X		X						X	X	X	X			X	8
				X			X						X	X		X				5
				X	X		X									X				4
													X	X						2
				X	X		X	X	X			X	X	X	X	X			X	11
	X			X			X						X	X		X				6
							X						X	X	X	X			X	6
					X				X				X	X					X	5
				X			X						X	X		X				5
					X								X	X	X					4
				X			X									X				3
								X												1
	X			X	X		X	X			X		X	X		X				9
				X			X		X				X	X		X				6
									X				X	X						3
													X	X						2
						X			X											2
																		X		1
					X		X				X					X				4
													X	X						2
										X										1
	X	X			X	X		X	X		X								X	8

Maintain confidentiality except when there's a potential miscarriage of justice.

Don't improperly disclose confidential information about association members or activities.

Don't work for the opposing side unless legally ordered or permitted to do so.

Don't unnecessarily repeat statements or beliefs of members expressed at seminars.

Keep association documents secure.

BE RESPONSIBLE

Serve justice.

Maintain evidence integrity.

Take appropriate action if you believe there could be miscarriage of justice.

Be responsible for work done under your direction.

Recognize the investigative significance of a result.

Ensure that all probative exhibits in a case receive appropriate technical analysis.

Produce the report (findings and conclusions) in a timely manner.

Take all reasonable steps to ensure you have the information necessary to carry out the work required.

Take all reasonable steps to gain access to all relevant available evidential materials necessary to reach a meaningful conclusion.

Maintain the integrity of information derived from evidence.

Use all reasonable efforts to fulfill association duties and protect and return association property.

PROMOTE ETHICAL BEHAVIOR

Abide by the code of ethics (code of conduct).

Report unethical behavior.

Maintain high ethical standards.

Don't tolerate or conceal another's unethical behavior.

Some conduct which is not specified in the Code of Ethics may still be considered a violation of the Code of Ethics.

Read the code of ethics and be aware of its implications.

TO THE ASSOCIATION

Do not exhibit conduct that is detrimental to the association.

Observe association bylaws.

Don't make statements on behalf of the association (without prior approval).

Serve the purposes of the association.

Enforce the rules and procedures of the association.

Cooperate with any official investigation by the association.

CONDUCT YOURSELF WELL

Be professional.

Exhibit exemplary personal conduct.

Conduct yourself in a manner that will not violate the public trust.

Don't break laws.

Give the best possible service.

	AAFS	ABC	ABFDE	ACSR	AFTI	ANZFSS	ASQDE	CAC	CSFS	ENFSI	FSS-UK	IABPA	IAI**	MAAFS	MAFS	NEAFS	NWAFS	RMABPA*	SAFS	SWAFS	Total
Maintain confidentiality except when there's a potential miscarriage of justice.					X			X		X							X				4
Don't improperly disclose confidential information about association members or activities.			X											X		X					3
Don't work for the opposing side unless legally ordered or permitted to do so.			X				X														2
Don't unnecessarily repeat statements or beliefs of members expressed at seminars.								X									X				2
Keep association documents secure.			X																		1
BE RESPONSIBLE																					
Serve justice.					X		X	X		X			X				X				6
Maintain evidence integrity.	X								X	X		X									4
Take appropriate action if you believe there could be miscarriage of justice.	X					X				X											3
Be responsible for work done under your direction.	X									X											2
Recognize the investigative significance of a result.								X									X				2
Ensure that all probative exhibits in a case receive appropriate technical analysis.	X								X												2
Produce the report (findings and conclusions) in a timely manner.						X			X												2
Take all reasonable steps to ensure you have the information necessary to carry out the work required.										X											1
Take all reasonable steps to gain access to all relevant available evidential materials necessary to reach a meaningful conclusion.										X											1
Maintain the integrity of information derived from evidence.										X											1
Use all reasonable efforts to fulfill association duties and protect and return association property.			X																		1
PROMOTE ETHICAL BEHAVIOR																					
Abide by the code of ethics (code of conduct).	X	X	X		X		X	X		X	X	X		X	X	X	X		X	X	15
Report unethical behavior.		X		X				X	X			X	X	X	X	X	X				9
Maintain high ethical standards.					X		X	X				X					X				5
Don't tolerate or conceal another's unethical behavior.															X					X	2
Some conduct which is not specified in the Code of Ethics may still be considered a violation of the Code of Ethics.																X				X	2
Read the code of ethics and be aware of its implications.																				X	1
TO THE ASSOCIATION																					
Do not exhibit conduct that is detrimental to the association.	X	X	X							X	X					X			X	X	8
Observe association bylaws.		X	X				X		X		X		X								6
Don't make statements on behalf of the association (without prior approval).	X		X	X								X	X			X					6
Serve the purposes of the association.							X			X											2
Enforce the rules and procedures of the association.			X																		1
Cooperate with any official investigation by the association.												X									1
CONDUCT YOURSELF WELL																					
Be professional.			X			X			X			X	X	X				X			7
Exhibit exemplary personal conduct.					X		X	X				X	X	X			X				7
Conduct yourself in a manner that will not violate the public trust.		X					X		X		X	X	X								6
Don't break laws.		X											X							X	3
Give the best possible service.							X								X					X	3

Survey: Ethics Codes

Conduct all your professional activities such that the health and safety of you, your colleagues, and the public is protected.

Don't discriminate.

Seek divine guidance.

SUPPORT THE PROFESSION

Tell the profession about new developments.

Strive to improve the profession.

Promote research.

Promote training.

Do not exhibit conduct that is detrimental to the profession.

Cooperate with peers.

Encourage study of forensic sciences.

	AAFS	ABC	ABFDE	ACSR	AFTE	ANZFSS	ASQDE	CAC	CSFS	ENFSI	FSS-UK	IABPA	IAI**	MAAFS	MAFS	NEAFS	NWAFS	RMABPA*	SAFS	SWAFS	Total
										X											1
										X											1
													X								1
	X							X					X	X	X	X	X			X	8
	X			X								X		X	X			X			5
	X						X						X								3
	X																			X	2
																X			X		2
													X								1
	X																				1

and refresh your memory as to the contents. Perhaps make a practice of doing this at least once a year so that the concepts remain fresh in your mind. Besides your association saying so, there are several other good reasons why you should be familiar with the content of your associations' codes of ethics:

1. CYA. Even the most cynical student of forensic ethics might find value in this reason: to protect one's posterior. If you are asked to do something inappropriate by a requester or a boss, being able to point to a professional code that supports your refusal to comply grants far more weight to your refusal.

2. Guidance. Codes offer insights that can help you to make sound professional decisions.

3. Peer pressure. Codes describe what your professional peers expect of you. Most people would like to know what constitutes alienating behavior so that they can avoid it.

4. Policing the profession. Codes offer a means to censure unethical behavior, thereby helping to ensure the public of a certain level of quality in the forensic sciences.

5. Clarification regarding others' behavior. Codes help elucidate what your responsibilities are if you witness unethical behavior.

Hmmm...maybe we do need stinkin' ethics codes, after all.

If you have an ethical dilemma in forensic science and you'd like some input about it, please feel free to contact me. I'll be happy to give you my confidential two-cents worth. Ideally, with each source's permission, I'd like to be able to present sanitized versions of real ethical dilemmas to the forensic community. They would be invaluable to use as vehicles for learning how to apply ethics codes to real life, perhaps through this newsletter and facilitated by the spreadsheet.

KEY TO ASSOCIATION ACRONYMS:

AAFS	American Academy of Forensic Sciences
ABC	American Board of Criminalistics
ABFDE	American Board of Forensic Doc. Examiners
ACSR	Association for Crime Scene Reconstruction
AFTE	Assoc. of Firearm & Tool Mark Examiners
ANZFSS	Australian & New Zealand Forensic Sci. Soc.
ASQDE	Am. Soc. of Questioned Document Examiners
CAC	California Association of Criminalists
CSFS	Canadian Society of Forensic Sciences
ENFSI	European Network of Forensic Sci. Institutes
FSS-UK	Forensic Science Society (United Kingdom)
IABPA	Int'l Assoc. of Bloodstain Pattern Analysts
IAI	Int'l Association for Identification
MAAFS	Mid-Atlantic Association of Forensic Scientists
MAFS	Midwestern Association of Forensic Scientists

NEAFS	Northeastern Association of Forensic Scientists
NWAFS	Northwest Association of Forensic Scientists
RMABPA	Rocky Mountain Assoc. of Bloodstain Pattern Analysts
SAFS	Southern Association of Forensic Scientists
SWAFS	Southwestern Association of Forensic Scientists

NOTES:

* RMABPA does not have a code of ethics, but has a three-part statement that any applicant for membership must sign.

** IAI Code of Ethics and Standards of Professional Conduct appear to only apply to certified members and those applying for certification.

Use with care: topics are paraphrased and categorizations are subjective. Refer to the original documents for precise wording, context, and meaning.

Candidates for the 2009 CAC Board of Directors



ADAM DUTRA FOR
PRESIDENT-ELECT

I began my career with the California Department of Justice in 1998 and have been a Criminalist with the San Diego Police Department for over seven years. I have been a CAC member since 1999. And have attended all but one CAC seminar since that time. I served as the CAC Membership Secretary from 2004 until 2006. I have been a member of the Training and Resources Committee and the Nomination Committee. I served as the workshop coordinator when the San Diego Police Department hosted the 2007 Spring Seminar. I would be honored to serve you as CAC President-Elect and thank you for your support.

GREG MATHESON FOR
EDITORIAL SECRETARY

Greg Matheson is currently the Director of the Los Angeles Police Department Criminalistics Laboratory. He has been with the laboratory as a criminalist, supervisor and manager for a total of 30 years. As a criminalist he was court qualified in toxicology, serology, crime scene investigation, and the examination of explosives, flammable liquids and vehicle lamp filaments. His professional involvement has included board of director positions with the California Association of Criminalists, California Association of Crime Laboratory Directors, American Society of Crime Laboratory Directors, the American Board of Criminalistics, and holds membership in the American Academy of Forensic Sciences.



MICHAEL PARIGIAN FOR
TREASURER

I have been a Forensic Scientist for the Ventura County Sheriff's Department since 1987 and a CAC member since 1988. I have served on the CAC Board of Directors for nine years. Membership in the CAC has provided me with numerous friendships and a great opportunity to meet fascinating people. I have been privileged to serve as your treasurer for the last two years and I would like to continue contributing to the CAC and its membership by offering my candidacy for treasurer once again. Thank you for your consideration.

JANET ANDERSON-SEAQUIST FOR
REGIONAL DIRECTOR SOUTH

Janet Anderson-Seaquist is currently serving CAC as the Regional Director-South and as the acting Study Group Chair for the Controlled Substances and Forensic Alcohol Study Groups. She is a Supervising Forensic Scientist at the Ventura County Sheriff's Department Forensic Sciences Laboratory and a portion of her 15+ years of forensic experience comes from her tenure at the City of Phoenix Crime Laboratory in Arizona. Janet would like to plan study groups more centrally located to increase attendance and looks forward to serving CAC thorough another term in office



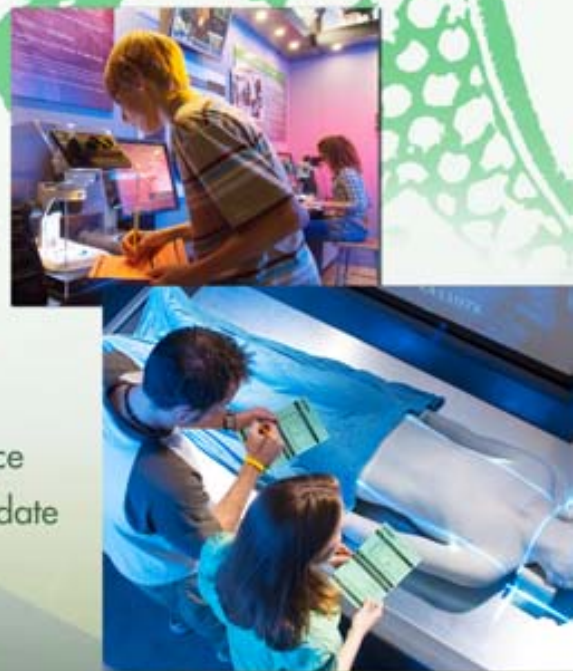
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