

# Northwest Association of Forensic Scientists

## NEWSLETTER

### PRESIDENT'S MESSAGE

I hope the membership of our Association appreciates the work that Roger Ely does in getting out our Newsletter. He has been hounding this recalcitrant person with undying dedication so that information will get out to you. My front office boss even thought it would be easier to get everything written up than answer (or hide from) all of Roger's calls. So Roger, keep up the good work. It probably isn't going to get any easier. (Ken, this is not a challenge!)

Now comes the paragraph where the president sez, "If you just missed the meeting in \_\_\_\_\_ (fill in the blank), then you really missed a \_\_\_\_\_ meeting. I'll wager the Reno meeting meets the criteria. Hats off (and nothing else) to Maria Fassett and Floyd Whiting for the meeting. As near as I could tell they never panicked once, even though Floyd was still putting the 20-year displays together on the afternoon of the banquet. Thanks also to Enrico Togneri for hosting us and for the tours of **Togneriland**. Interesting design to have an inside lab in a triangle building and have NO outside windows.

As you will read elsewhere, the Fall meeting for 1993 is going to be held in Boise. Pam volunteered to host us. Now that sounds interesting ... I don't want to start asking for suggestions for their meeting since Bend comes before them and I could use some ideas first! A quick poll showed there was interest in a buried body crime scene workshop, so that is on the agenda. Gary Knowles will have to drag the skeletons out of his closet again. Maybe his theme song is going to be "Dem Bones." Speaking of Gary and his closet, for those of you who like a little gossip, it seems there is a young lady who works at the Oregon Police Academy who is wearing a shiny, new ring. Someone who met Gary when he was presenting the buried body class at the Academy. The problem we have now is getting the smile off his face. We thought it was just due to his warped sense of humor.

One more time for the ABC's of life. Read the info Dale Mann has submitted to the Newsletter. Remember, you are paying for it. Roughly \$800-1000 per trip. There is also a response to a letter from Mr. Richard Tontarski printed in here. This is basically what all the members at the Reno meeting felt was appropriate. If you want to have any effect you must stay informed and make your thoughts known. Try sending letters to the Editor. Roger loves to be able to fill the space. (I hope this one of mine satisfies him for a while!)

Put Portland on your fall calendar. Until then, remember to always wear your gloves ...

*Mike Howard*

## LETTER SEEKS SUPPORT FOR ABC

*(The following letter was received by President Mike Howard from Richard Tontarski, President of the American Board of Criminalistics.)*

Dear Mr. Howard:

I am asking for a letter of support from your Association to support the ABC's request's for grant funding this year. Grant funding will allow us to get the additional professional development help needed, reduce the time needed to make Certification a viable self-sustaining program, and reduce the financial burden on Member Organizations. Support letters are needed by May 15 to meet grant deadlines. I have enclosed draft wording you may want to consider.

I realize that your Association has chosen not to be formally involved in the certification effort. There are probably several reasons for that initial decision, and I respect those. I am sure we all want to further our profession's growth and development. There are a number of forensic scientists around the country who think a meaningful certification program will help forensic science evolve. Your letter of support will help us reach the goal of developing a certification program for those who want to participate.

We have come a long way with five Regional Associations' and the Canadian Society of Forensic Sciences' support during the last 2 years (see Executive Summary of ABC February Board Meeting and ABC Survey Summary enclosed). Your help to obtain outside funding is crucial to moving the process forward.

I hope you will reconsider becoming involved in ABC in the future. The ABC will continue to develop and administer a Certification Program that reflects the views and needs of the forensic examiners who want to apply for Certification. I will be calling you shortly to discuss these requests and to answer any questions you may have.

Sincerely Yours,

(signed)

Richard E. Tontarski, Jr.  
President, American Board of Criminalistics

### *EXAMPLE REGIONAL ASSOCIATION SUPPORT MOTION*

*This is the motion that affirms your Association's commitment to the process. It will be used to demonstrate the level of support that exists for certification in grant requests. Grantors often look for this kind of supporting documentation for assurances that their investment (usually a one-time investment) will be going toward a viable effort.*

Move that ...

The [Your Association] supports the concept of certification for the forensic science profession, and the American Board of Criminalistics process for developing a certification program.

Further, the [Your Association] will continue to participate in the American Board of Criminalistics as a means of providing a certification process to those members who may wish to become certified.

### NWAFS OFFICERS - 1992

#### Executive Committee

President .....	Mike Howard, OSP Forensic Lab - Bend, OR
President-Elect .....	Ken McDermott, WSP Crime Lab - Kelso, WA
Secretary-Treasurer .....	Lionel Tucker, Jr., DEA Western Lab - San Francisco, CA
Member-at-Large .....	Don Wyckoff, ID Bureau of Forensic Services - Pocatello, ID
Past President .....	Gary Knowles, OSP Forensic Lab - Medford, OR

#### Committee Chairmen

Continuing Education .....	Arnold Melnikoff, WSP Crime Lab - Kelso, WA
Historical .....	Brad Telyea, OSP Forensic Lab - Portland, OR
Membership .....	John Bowden, CA Criminalistic Institute - Sacramento, CA
Technical Advancement .....	Robert Thompson, Genelex Corp. - Seattle, WA
Editorial .....	Roger Ely, DEA Western Lab - San Francisco, CA

### AND OUR REPLY ...

Dear Mr. Tontarski, Jr.:

With regard to your letter of April 8, 1992 asking for a motion of support from the Northwest Association of Forensic Scientists, I brought it up to the members present at our spring meeting in Reno. It was a unanimous decision by the members present that the NWAFS would not pass a motion of support at this time.

The membership elected Dale Mann as our representative to ABC for the purpose of gathering information. Even members opposed to certification felt we should know what is going on. At

this time the members do not feel we have enough information to support (or object to) the total certification process as being developed by the ABC. For this reason I am writing you to report the position of the NWAFS remains neutral and we will not approve monies beyond Mr. Mann's expenses.

Sincerely,

(signed)  
Michael A. Howard  
President, NWAFS

### AS I SEE IT

*ROGER A. ELY*  
*EDITOR*

#### *RENO MEETING A GREAT SUCCESS!*

The spring 1992 meeting in Reno has come and gone, yet the memories linger. For those of you who weren't lucky enough to attend, you missed one of the best Association meetings in years. Many thanks to Floyd Whiting, meeting chairperson, and a special "thank you" to Maria "Boom-Boom" Fassett for putting on such a great program. A large part of the credit for the meeting goes to Maria who, even though she isn't a member, put

countless hours of work in to all the activities and the little details that have to fall into place for a meeting to happen. From the workshops, to the wine and cheese tasting, to the papers, to the Basque dancers at the banquet - all was perfection. Not only that, but I got a note from Maria the other day and she indicated she estimated we made about \$1500 on the meeting! Great job, guys!

Well, you ask, what were some of the highlights? John Bowden of the California Criminalistics Institute presented a

### ABOUT THE NEWSLETTER ...

The Newsletter is the official publication of the Northwest Association of Forensic Scientists. It is published 4 times a year in the months of March, June, September, and December. The Newsletter welcomes submissions from its membership such as technical tips, case studies, literature compilations, workshop or training notices, reference citations, commentary, historical accounts, and other topics of interest to the membership. While not required, it is requested written material submitted for publication to the Newsletter be word processed using WordPerfect 4.2 or greater, WordStar, Microsoft Word, Microsoft Word for Windows, or AmiPro on either 5.25 or 3.5 inch floppy disks. Deadline for submission is the 15th of the month before publication; however, exceptions can be made. For more information regarding the Newsletter, contact:

Roger A. Ely, Editor  
DEA Western Laboratory  
390 Main Street Room 700  
San Francisco, CA 94105  
(415) 744-7051 - voice



*Left:*  
Larry Campbell and others in the Blood Spatter Workshop look on as Jim Pex exams small spatter deposits under a stereomicroscope.

one-half day workshop to us druggies on steroids - their nomenclature, structures, and identification. Too bad only 8 of us showed up for this one.

I heard plenty of rave reviews on the blood spatter workshop conducted by Gary Knowles and Jim Pex of the Oregon State Police Forensic Labs in Medford and Coos Bay, respectively. A photo of some the participants of this workshop appears elsewhere in the Newsletter. The students all remarked on how valuable the hands-on exercises were for this class. Its great the Association can draw on its own members to put on quality training sessions. This is a resource that is often overlooked.

The technical sessions featured a wide range of papers on many different topics. Unlike the past where there was a heavy load of serology and DNA papers, the breadth of work presented was refreshing. Read the abstracts later on in the Newsletter for an idea of what was presented.

One of the most enlightening activities (no, not the hospitality suite shenanigans!) was reading through some of the historical materials of the Association. Floyd spent a lot of time preparing poster board displays showing drafts of the Association's logo, correspondence regarding incorporation, old Newsletters, photos of some rather memorable moments in the hot-tub, and other items of historical note. This is, after all, the 25th anniversary of the very first meeting of the Association in Spokane, Washington. Included in the display was a notice announcing the meeting would be held at the Holiday Inn - single rooms were \$11.50, doubles were \$15.00. What a contrast to the

prices today! One of the items we can be proud of is in 1967 the membership dues were \$15 - in 25 years, they managed to double to \$30 - what a bargain!

#### *DISTINGUISHED EWE AWARD*

Yes, this meeting saw the transfer of Terry, the Association's anatomically correct inflatable sheep, to the loving, kind hands and safekeeping of Washoe County Crime Laboratory Director Enrico Togneri. Rico, president-elect of the American Academy of Forensic Sciences, somberly accepted custody of Terry pledging to get her slow leak repaired before she hits the road again at the Portland meeting. The experience appeared to be too much for Terry, as the last I saw her she looked a little deflated. However, she did perk up when I promised her we would travel to San Antonio in 1994 to witness the inauguration of President Rico before the Academy.

*This meeting saw the transfer of Terry, the Association's anatomically correct inflatable sheep to ... Enrico Togneri ... President-Elect of the American Academy of Forensic Sciences ...*

How does one aspire to win such an award? We're not telling, but it is extremely subjective. This is yet another prestigious award for Rico to add to his resume and trophy cabinet! Next time we spring for an inflatable sheep we should get one with a 50,000 mile or 5 year warranty ...

*Right:*

Meeting Chairperson Floyd Whiting works on displays of documents and photographs from the first 25 years of the Association.



#### *CERTIFICATION ... AD NAUSEAM*

Our worst fears were not realized. In the last Newsletter, I mentioned that ABC had decided to set a fee for members of their governing board. At the time, it was not clear whether the fee would apply to us to cover Dale's position on the board. I am happy to announce that the fee does not apply to us. I also found out from Dale that he DOES NOT have a vote in any matter the board acts on - he has input, but no vote. So, while it won't cost us any money to remain as advisors to the board, it will still cost the Association nearly \$2000 a year for the representation. Starting in the fall, a full accounting of the financial matters of the Association will be printed with the minutes - you can keep the tally yourself!

ABC is trying to get a grant for funding and has asked the Association to write a letter supporting certification and the ABC's work. The letter appears in this Newsletter, along with the less than positive reply. We are still in a fact gathering mode and are not in a position to pronounce or denounce certification ... officially. In talking with many members from various laboratories across the nation, it is clear every laboratory is feeling a real pinch in the pocket book. Many of the people attending the Reno meeting paid their own way, a trend which has been steadily increasing over the past couple of years. This lack of training and travel money is significant in light of the re-certification process as outlined by the ABC. People will have to pay their own way to take courses, present papers, attend meetings, participate in workshops, and a variety of other activities the agencies were paying for. Now that money is dwindling for this extracurricular activity, will the certification bandwagon slow a bit? Should be interesting ....

#### *SOMETHING NEW*

As you might have noticed, the look and layout of the Newsletter has changed again. Gone is the single, full color cover and the loose-leaf format. The booklet style is a little more durable and easy to file away in a binder. I've also experimented with running some black and white photographs - you know, come into the 1990's sort of stuff.

Something else new you'll notice are the features from other regional Newsletters. At the American Academy meeting, I volunteered to head a project to promote a diskette exchange with the other regional Association Newsletter Editors. The project is presently being supported by NWAFS, CAC, MAFS, MAAFS, NEAFS, SWAFS, and the Canadian Society of Forensic Science. Essentially, we trade the computer files each of us generates for our respective Newsletters. This means our meeting abstracts will probably be seen by people other than those in our Association. Responses from the Editors in a survey were very positive. Hopefully, this data exchange will provide more information you can use in your job.

#### *THAT'S A WRAP!*

Another issue has come and gone. It is the leading edge of summer, and many of you are planning your summer vacations and quality time with family and friends. So, take it easy - push the casework to the side for awhile (but look busy!) and enjoy the weather. Don't let the bastards get you down, and start putting away your change for the Portland meeting - Kenny, Arnie, and Brad tell me it going to be a great one! See ya there!

**MINUTES OF THE BUSINESS MEETING  
RENO, NEVADA  
MAY 21, 1992**

*LIONEL A. TUCKER JR.  
SECRETARY-TREASURER*

The meeting was called to order by President Mike Howard.

**Treasurer's report:**

(period October 2, 1991 to May 20, 1992)

**Assets:**

Amount in checking account .....	\$7,595.00
Deposits to checking .....	\$6,368.00
Interest .....	\$104.00
Sub total .....	\$14,067.00

**Expenses:**

Newsletter .....	\$1,308.00
Workshop, Fall 1992 mtg. ....	\$1,200.00
Workshop, Reno meeting .....	\$280.00
Hospitality room, Coeur d'Alene .....	\$50.00
Dale Mann, ABC representative	
New Orleans .....	\$1,065.00
Lexington, KY .....	\$640.00
Brad Telyea, dues refund .....	\$30.00
Lionel Tucker, AAFS .....	\$200.00
Alan Spanbauer, Fall 1991 mtg. ....	\$3,805.00
Subtotal .....	\$8,578.00

Total in checking .....	\$5,489.00
Amount in Dreyfus .....	\$11,294.00

Total held by association ..... \$16,783.00

**New Business**

Fall meeting in Portland, Oregon Oct. 27-30 at the Columbia River Red Lion Inn. Contact Bred Telyea with your suggestions.

At the present time there are a number of workshops being considered

1. trace evidence
2. Serial number restoration
3. PCR
4. shoe print
5. molecular genetics

Spring meeting Bend, Oregon Inn of the Seventh Mountain in April

Motion to have the Fall 1993 meeting at Pam's place passed, there was only one negative vote.

Motion to have a detailed financial report at business meeting passed.

There was more talk of having one meeting a year, once again it was shot down.

**Committee reports**

- A. Membership committee: John Bowden, see newsletter.
- B. Historical: there was a display at banquet of photographs and other artifacts of previous meetings to celebrate our 20th anniversary.
- C. Newsletter: Roger request that submissions be on computer disk. He would also like to remind everyone that he now has a scanner with OCR capabilities. There will be an exchange of information via computer disk between Forensic Associations. In this way we hope to obtain information regarding meetings, workshops, and educational material. This information will be published in the newsletter.
- D. Technical advancement: we still need volunteers. Contact Robert Thompson if interested.
- E. Continuing education: usage of materials consisted of two sets of tapes during a ten month period.
- F. Executive committee: Motion to Fund officers to attend NWAFS meeting if the need arises Passed. The amount to be determine on a individual basis by the Executive Committee

**Old Business**

*Certification*

The NWAFS received a correspondence from the ABC concerning a funding issue. (See letter as published in this issue of the Newsletter ). After much discussion it was decided to draft a letter indicating our position which at this stage is in a information mode.

Meeting adjourned.

## FALL MEETING OF NWAFS IN PORTLAND

The fall meeting in Portland is coming together nicely even at this early date. The meeting will be held at the Columbia River Red Lion Hotel from October 27 through 30. Room rates are \$65.00 per night for a single and \$75.00 per night for a double. To make reservations, contact the Red Lion Hotel at (503) 283-2111.

Plans are in the works for a workshop on the microtoming of forensic paint samples and other trace evidence. The workshop will be taught by Dale Quakenbush, a retired paper chemist and microscopist. Another workshop planned will be a basic photography course taught by Roger Ely. This workshop will emphasize basic camera skills, parts, and exposure with a heavy emphasis on flash photography. This workshop will include a night time shoot using some of the flash techniques learned that day. Law enforcement officers from various agencies in the area may also want to take advantage of this workshop to increase their photographic skills. A wildlife symposium will concen-

trate on new techniques applied to wildlife forensics as well as information which can be adapted to wildlife cases.

Many individuals have already expressed a desire to present papers on such topics as GC/MS and steroids, photomicrography, image transmission and archiving, and wildlife serology. I am sure that there will be a broad cross section of topics which always makes for an interesting scientific session. The registration fee for the two day session will be \$75.00 for members, \$85.00 for non-members, and a one day registration fee of \$15.00. No fees have been determined as yet for the workshops.

If you have further questions, contact either Arnold Melnikoff or Ken McDermott at the Washington State Patrol Crime Lab - Kelso at (206) 577-2087 or Brad Telyea at the OSP Forensic Lab - Portland at (503) 229-5017.

See you in Portland!

## DNA RELATED INFORMATION

### DNA AUTORADIOGRAPH INTERPRETATION COURSE OFFERED

The Midwestern Association of Forensic Scientists will be hosting a Forensic DNA autoradiograph interpretation workshop April 12-14, 1993 at the Missouri State Highway Patrol Law Enforcement Center in Jefferson City, MO. Instructors for the course include Mark Stolorow. For more information on the course, contact:

Everett Markway  
Missouri State Highway Patrol  
Criminal Laboratory Division  
1510 East Elm Street  
Jefferson City, MO 65101  
(314) 751-3313 ext. 134

### STUDY BACKS USE OF DNA EVIDENCE IN COURT, CALLS FOR REGULATING LABS

*By JOE DAVIDSON  
AND JONATHAN M. MOSES  
STAFF REPORTERS OF THE WALL STREET JOURNAL  
APRIL 15, 1992, PAGE B4*

WASHINGTON - The National Research Council endorsed the use of DNA evidence in criminal court cases but said a mandatory accreditation program should be developed to monitor laboratory work.

The long-awaited study on genetic typing is expected to help resolve disputes over the admissibility of such evidence in court.

"DNA-typing for personal identification is a powerful tool for criminal investigation and justice," said Victor McKusick, chairman of the council's committee on DNA technology in forensic science.

"But there are certain standards that need to be met consistently from a technical point of view, and aspects of the statistical interpretation of the findings that need to be taken into account in reporting the results of tests," he said.

DNA - deoxyribonucleic acid - is present in the cells of every organism, including those human cells most likely to be found at a crime scene - blood, sperm, hair roots and saliva. Every person, with the exception of identical twins, has a unique DNA type. A DNA print left at a crime scene can be matched against a defendant's genetic code. With the procedures it currently uses, the Federal Bureau of Investigation estimated its inaccuracy rate at about one in one million.

Criminal defense lawyers, however, have contested the use of DNA evidence, contending it has not yet been proved appropriate for court use.

Peter Neufeld, co-chairman of the DNA task force of the National Association of Criminal Defense Lawyers, said the report means that "literally hundreds of convictions will have to be reopened."

He pointed to a section of the report referring to a kind of error in DNA - typing known as "band-shifting," which, the study said, "could cause two DNA samples from one person to show different patterns or DNA samples from two different persons to show the same pattern."

Mr. Neufeld, an adjunct associate professor at Fordham Law School in New York, said band-shifting may have accounted for unjustified convictions. He said it was important to ensure the accuracy of DNA evidence, because it is used to help decide "who gets fried in the electric chair, who goes free."

The FBI, a strong advocate of DNA-typing in criminal investigations, was one of six groups that funded the two-year study. Though FBI officials generally praised the report, John Hicks, assistant director of the agency's laboratory division, questioned the need for formal regulations governing laboratories doing DNA work. He said that there are about two dozen

such facilities in the U.S. and that most of their technicians have been adequately trained by the FBI.

Formal regulations would require a new level of bureaucracy and new expenditures, he said. The report specifically recommended that the regulation and accreditation process should be the responsibility of the Department of Health and Human Services, with consultation by the Justice Department.

The Justice Department, which oversees the FBI, "may be perceived as an advocate for application of the technology," according to the report. And the department "may not be perceived as providing adequate assurance to the public or to a defendant facing prosecution" by federal authorities, it added.

The report had been scheduled to be released tomorrow, but the council rushed it out after the New York Times reported in yesterday's editions that the study said that courts should stop using DNA evidence until laboratory standards have been tightened and the basis of the technique more strongly established.

While acknowledging that the facts in the Times article were "basically correct," Dr. McKusick, a Johns Hopkins University medical professor, asserted that the story gives a "misleading" impression about the committee's conclusions. A Times spokesman declined to comment on the matter.

Both advocates and opponents of DNA typing in criminal cases point to numerous court cases that back their position. "Recently, a growing number of state and federal court decisions have recognized the reliability of DNA profiling," FBI Director William Sessions said in a statement.

But in its recent publication, the criminal-defense lawyers association noted "seven new decisions of significance on the appellate- and trial-court level excluding DNA evidence."

## BIBLIOGRAPHY FOR HEADLAMP EXAM AVAILABLE

A bibliography of references for vehicle lamp examination has been prepared. Copies of the references (except for the Traffic Institute's publication "Lamp Examination for On or Off in Traffic Accidents") are compiled into a booklet and are available for checkout from Arnold Melnikoff, NWAFS Continuing Education chairman.

To obtain a bibliography list contact:

Kerstin Gleim  
WSP Crime Lab  
2nd Floor, Public Safety Bldg  
610 Third Ave.  
Seattle, WA 98104  
(206)464-7074

To check out the booklet with the references, ask for "Vehicle Lamp Examination References". Contact:

Arnold Melnikoff  
WSP Crime Lab  
P.O. Box 888  
Kelso, WA 98626  
(206) 577-2087

To purchase a copy of the Traffic Institute's publication "Lamp Examination for On or Off in Traffic Accidents" by Baker, Aycock and Lindquist, contact:

The Traffic Institute  
Northwestern University  
(800) 323-4011

Contact Kerstin Gleim with additions and/or corrections to the bibliography list, or for discussions about vehicle lamp examinations.



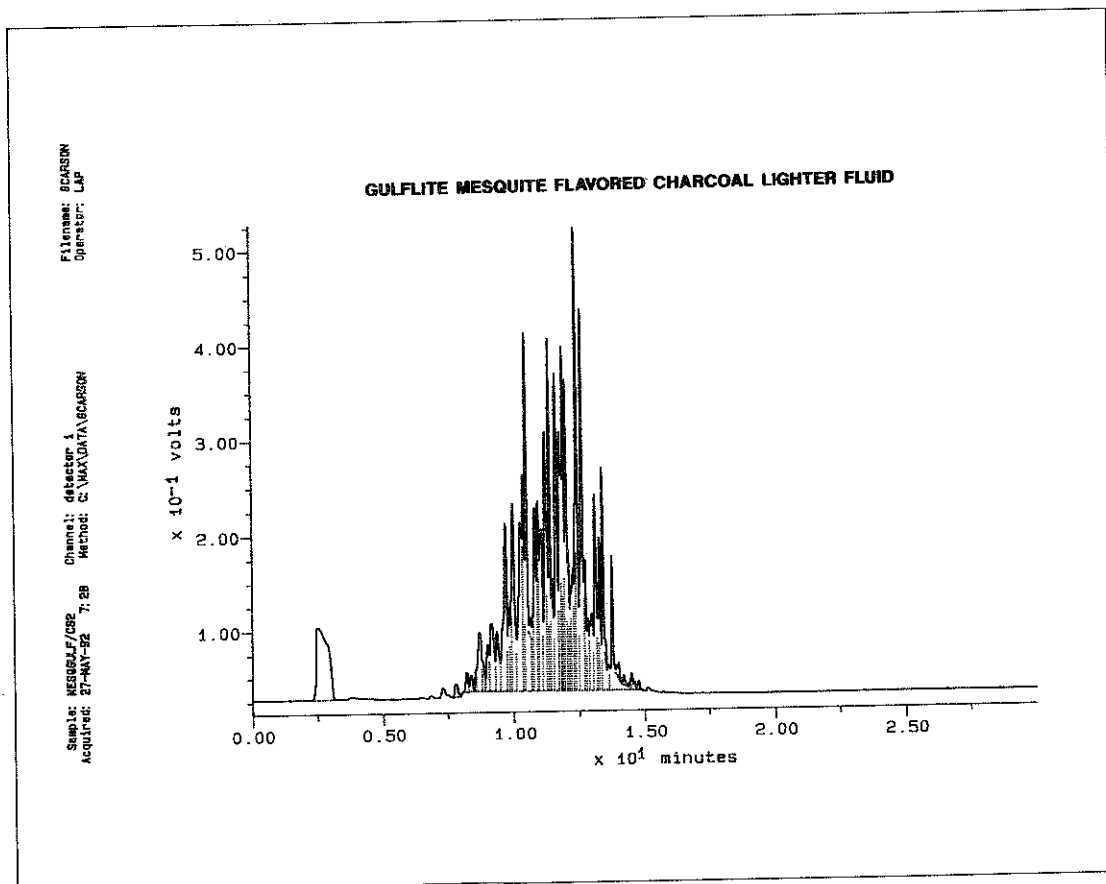
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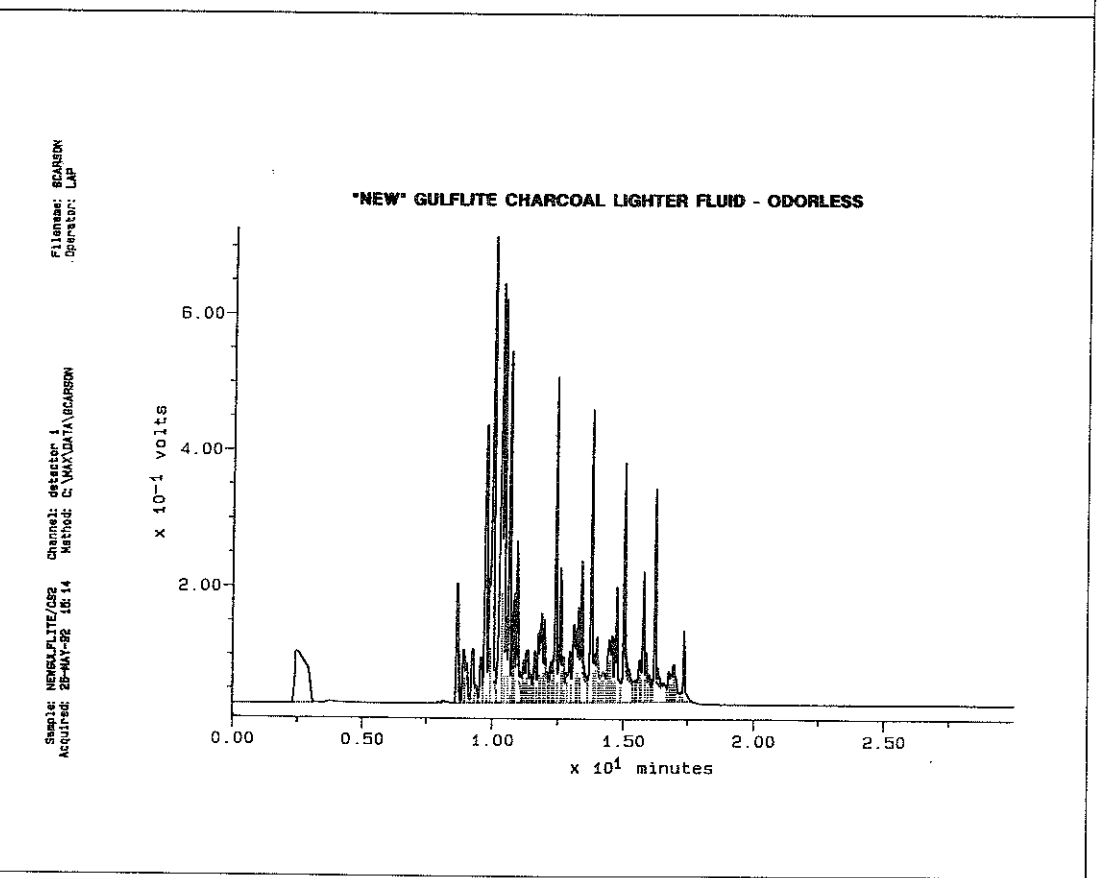
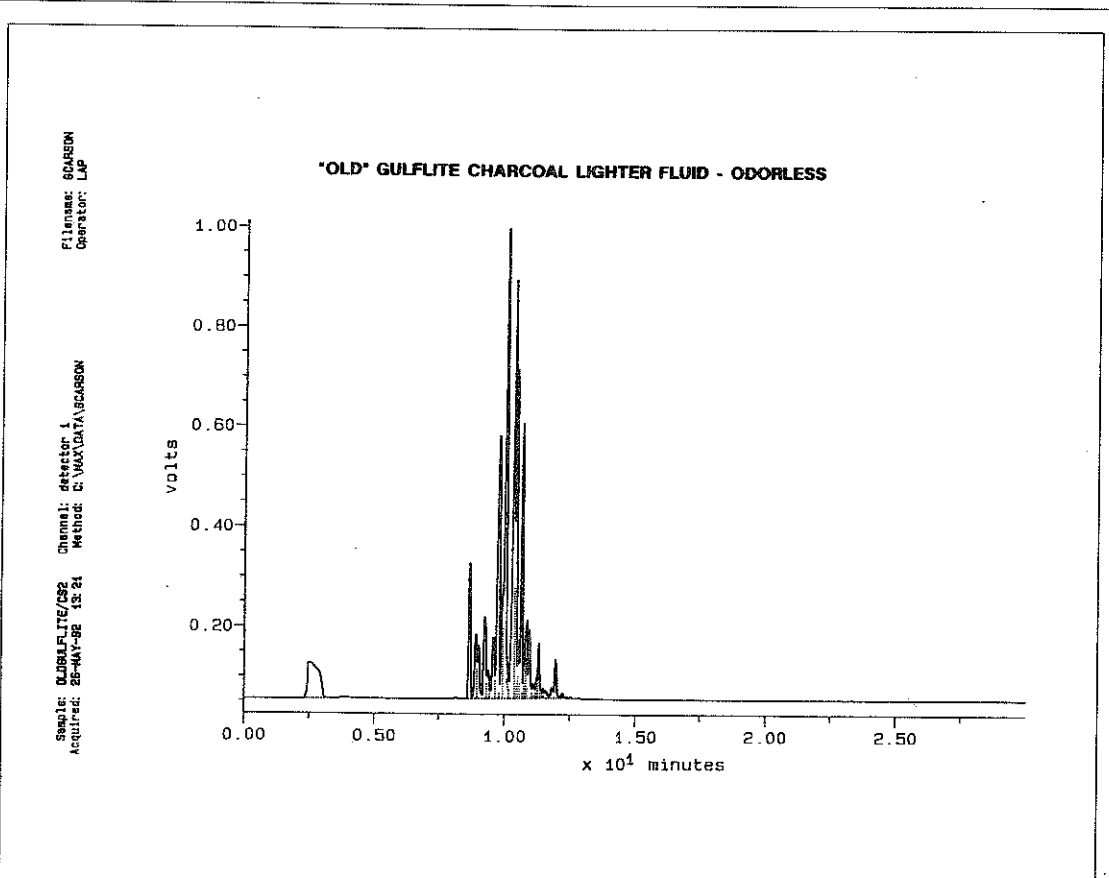
LARRY PEDERSON  
CITY-COUNTY FORENSIC LABORATORY  
PO Box 759  
GREELEY, CO 80632

A quick note of warning is appropriate for analysts doing fire accelerant identifications. As part of a fire investigation, I purchased ten different brands of charcoal lighter products for analysis. I almost didn't buy Gulflite, but I did. I almost didn't analyze Gulflite, but I did. Much to my surprise the chromatogram I got from my Gulflite odorless product was not what I had come to expect. There is now a C12-C16 petroleum distillate fraction in addition to the isopar pattern of the past. A regulatory affairs representative with the manufacturer confirmed that a

formulation change had taken place which meets their flavor, flash point, smoke and other standards regarding the "odorless" product.

Also, the Gulflite mesquite flavored product was distinctly different from both the "old" and "new" odorless products. I have no previous experience with the mesquite flavored product and didn't ask if any changes regarding it had taken place.





## ABSTRACTS OF PAPERS PRESENTED AT THE NWAFS MEETING RENO, NV MAY 21 - 22, 1992

### "Using ChemLAN Networking To Improve Laboratory Productivity And Preserve Investments In Instrumentation"

Maureen Brock, PhD.  
Hewlett-Packard  
4244 S. Market St.  
Sacramento, CA 95834  
(916) 921-4053

Criminalists are forced each day to deal with a mixed bag of instrument data systems. Once in the lab, a sample may be analyzed by GC in arson, GC/MS in drugs and FTIR in trace analysis. Additionally, many laboratories are implementing LIMS that require tedious manual data entry. To address these areas of productivity backlog, many crime labs are considering local area networks (LANS).

ChemLAN is a Hewlett-Packard networking package that addresses these productivity bottlenecks by performing automatic file conversion and transfer between all Hewlett-Packard data systems. Data collected in arson on a Pascal GC Chemstation can be displayed with GC/MS data on the same screen. Pascal GC, LC and MS Chemstations can be connected to DOS or UNIX for data reduction in a more modern, multitasking environment. With ChemLAN Sequencing, existing DOS and Pascal systems can acquire data for automatic data reduction on a UNIX Chemstation.

ChemLAN is based upon industry standards for networking and is designed to work with Hewlett-Packard Pascal, DOS and UNIX Chemstations, plus the RTE-A HP1000. ChemLAN can be used to minimize tedious and error prone manual entry into a LIMS by direct report transfer at the end of a run.

### "Comparison Of Two Solid Phase Extractions For Acid/Neutral Drugs"

E. J. Formoso, B. K. Logan, D. B. Predmore  
Washington State Toxicology Laboratory  
325 9th Ave. ZA-88  
Seattle, WA 98104  
(206) 223-3536

A complete screen for drugs in biological materials should include a provision for compounds with acidic or neutral character. This includes anticonvulsants and seizure medications such as the barbiturates, meprobamate, phenytoin, carbamazepine, and valproic acid, along with theophylline, acetaminophen, and caffeine.

Classically, barbiturates were screened for using UV spectroscopy; however this was non-specific and did not detect some of the other significant AEDs. Gas chromatography (GC) methods are superior to UV spectroscopy as they are specific, quantitative, and automatable. This paper presents a comparison between two extraction methods for drugs with acid and neutral character. One is a solid phase partition method using Amberlite XAD-2 resin; the second is an immobilized solvent extraction on diatomaceous earth. All extracts were analyzed using an automated capillary GC method.

Both extraction methods were evaluated in terms of absolute recovery from water and blood for a number of representative drugs. Accuracy was determined by the analysis of a commercial serum standard. A series of whole blood samples were also analyzed using both methods. A qualitative assessment of extract quality and ease of extraction were made.

Both methods were valid and sensitive for the majority of drugs but had different selectivities. The XAD method had a higher recovery for phenytoin, while the diatomaceous earth method had better recoveries of primidone, acetaminophen, and meprobamate. The diatomaceous earth extracts were generally cleaner, while the XAD method was easier to use when multiple extractions were done.

### "Peak Breath Alcohol Concentrations, Widmark Calculations And Some Interesting Observations Following Drinking"

D. B. Predmore, B. K. Logan  
Washington State Toxicology Laboratory  
325 9th Ave. ZA-88  
Seattle, WA 98104  
(206) 223-3536

The absorption of alcohol and prediction of the breath alcohol level (g/210 L) based on a Widmark calculation are two of the issues commonly encountered by the Forensic Toxicologist in a court of law. Often the reverse calculation going from the reading to the number of drinks a person consumed is done as well. Many additional propositions related to these questions are often encountered as well.

Eighteen people (nine men and nine women) were tested and data collected to test some of these commonly encountered questions. They consumed measured quantities of 80 proof beverage in a recorded time frame which ranged from 45 minutes to 90 minutes. Estimates of the peak breath alcohol concentration were done based upon the amount consumed, the time to the

peak, a Widmark "r" factor of 0.68 for men and 0.55 for women, and an elimination rate (Widmark B) of 0.015 g/210 L/hr.

The average time to the peak breath alcohol concentration for all eighteen persons was 24 minutes after the last drink with a range from 7 to 64 minutes. The average peak breath alcohol reading for the eighteen volunteers was 0.109 g/210 L. The average predicted level for them was 0.106 g/210 L. All of the predictions were within plus or minus 0.02 g/210 L of the peak level actually achieved. The range of breath alcohol readings was from 0.05 g/210 L to 0.19 g/210 L.

Recently, an additional ten persons (five men and five women) volunteered and were tested. They consumed either 80 proof beverage or beer or both. The results for these persons were similar to the eighteen with one exception. Their average time to the peak breath alcohol concentration was eighteen minutes. They had similar Widmark correlations with one exception noted.

#### **"The Effects Of Buffer Recirculation On Mobility Distortion"**

Robert M. Thompson  
Genelex Corporation  
2203 Airport Way South, Suite 350  
Seattle, WA 98134  
(206) 382-9591

When performing separations of DNA restriction fragments on agarose gels, distortions in the mobility patterns are often observed. These effects are pronounced by the extended running periods required for accurate sizing. The cause of these distortions is the development of chemical and thermal gradients as a result of buffer depletion and uneven heat dissipation. Buffer depletion is caused by the production of hydrogen ions at the cathode and hydroxide ions at the anode. Heating of the gel during the run is caused by power dissipation. If the gel is not of a uniform temperature, electrical field strength gradients will develop causing differences in DNA mobility at different locations in the gel. Recirculation of the electrophoresis buffer, between the reservoirs and over the gel, can eliminate the majority of these problems.

A self-recirculating electrophoresis tank based on a "gas-lift pump" design can alleviate distortions without having the expense, inconvenience, and reliability problems of peristaltic pumps, clamps, and hoses.

#### **"Classical Chemical Ionization With The Magnum Ion Trap"**

John Ragsdale  
FINNIGAN MAT  
355 River Oaks Parkway  
San Jose, CA 95134  
(208) 433-4800

A new ion trap chemical ionization enhancement has recently been developed by Finnigan MAT. With Advanced Chemical Ionization, improved minimum detection limits and classical mass spectra are demonstrated with the re-evaluation of the Harkey, Henderson, and Zhuo paper "The Simultaneous Quantitation of Cocaine and Its Major Metabolites in Human Hair by Gas Chromatography/Chemical Ionization Mass Spectrometry" when performed on a Finnigan MAT Magnum system.

#### **"From The Kitchen Of Uncle Fester"**

Raymond Kusumi  
WSP Crime Lab  
2nd Floor Public Safety Building  
3rd Ave.  
Seattle, WA 98104  
(206) 464-7074

A slide presentation of the step process of making P2P (phenylacetone) as outlined by Uncle Fester in Chapter 8 of his 1st and 2nd edition book "Secrets of Methamphetamine Manufacture". This visual illustration will help investigators and scientists to recognize the equipment and chemicals used in this process and what step of the process they are in.

#### **"Having A Blast With Ether"**

Raymond Kusumi, Dale Mann, Frank Boshears  
Washington State Patrol Crime Laboratory  
2nd Floor Public Safety Building  
3rd Ave.  
Seattle, WA 98104  
(206) 464-7074

A technique of opening ethyl ether cans for sampling, especially when peroxides are suspected to have formed. This technique employs the use of blasting caps to gain access into the cans without causing a fire or high order explosion.

**"Designing And Building A PCR-Based Laboratory"**

Theresa Spear  
 Santa Clara County Crime Laboratory  
 1557 Berger Drive, B-2  
 San Jose, CA 95112  
 (408) 299-2224

Properly designing a laboratory requires a thorough understanding of the work that will be performed. The design must facilitate the proper execution of the analytical steps and maximize efficiency by taking into account work flow. This paper will describe the process the Santa Clara County Crime Laboratory went through to design a PCR-based DNA laboratory, remodel existing space, select and purchase equipment, install laboratory benches and equipment and implement DNA extraction, amplification and typing procedures.

**"Coughed Bloodstain Patterns: A Phlegm Show You Might Not Expectorate"**

Gary A. Knowles  
 Oregon State Patrol Forensic Laboratory  
 650 Royal Ave., #11  
 Medford, OR 97504  
 (503) 776-6118

Using examples from actual death investigations, this paper will reveal the characteristics of expectorated blood patterns. Expectorated blood, whether coughed or resulting from the impact of a bullet, reveals bloodstains similar in size to those caused by a bludgeoning or a gunshot. From tests for amylase, pattern interpretation, observations at the crime scene and the results of autopsy, expectorated bloodstain patterns can be identified helping remove potential confusion in crime scene reconstruction.

**"Alcohol As A Weapon - The Paul Jordan Case"**

Larry Campbell  
 Regional Coroner  
 B.C. Coroners Service  
 4595 Canada Way  
 Burnaby, B. C. V5G 4L9  
 (604) 660-7718

From 1967 to 1988, ten women died in the city of Vancouver under remarkably similar circumstances. In all cases, the blood alcohol levels were markedly elevated ranging from 0.34 mg/L to 0.91 mg/L. The women had been in the company of a male named Paul Jordan immediately prior to their deaths and post mortem examinations did not reveal any injuries or indication of foul play. All of the cases were investigated by the police and coroners service but due to lack of evidence, no charges were laid until 1988. This paper will review the investigations into these deaths and the subsequent precedent setting outcome.

**"The Effects Of Argon Laser Light, Alternate Light Source, And Cyanoacrylate Fuming On DNA Typing Of Human Bloodstains"**

Renee Roelofs, Ed Shipp, Enrico Togneri, Raymond Wright,  
 David Atkinson, Berch Henry  
 Washoe County Sheriff's Office, Forensic Science Division  
 911 Parr Blvd.  
 Reno, NV 89512  
 (702) 328-2800

Due to the detrimental effects of ultraviolet light on deoxyribonucleic acid (DNA), it is important to examine the effects of other types of light energy sources also used in the forensic science field. Restriction fragment length polymorphism (RFLP) profile results were obtained from DNA isolated from human bloodstains which had been subjected to various light sources. The light sources included a model 2010 argon ion laser, a Laser Print 1000 argon ion laser, and an Omniprint 1000 alternate light source. Bloodstains were exposed to these light sources for varying amounts of time. All RFLP profile results obtained from treated samples were identical to the DNA profile from untreated bloodstains.

Another important technique used in forensic science is cyanoacrylate ("superglue") fuming. This technique is commonly used to enhance fingerprints. DNA was isolated and RFLP patterns were obtained from bloodstains exposed to cyanoacrylate fuming for various amounts of time. All RFLP profile results obtained from these samples were identical to the DNA pattern from untreated bloodstains.

**"Absorption, Distribution, And Elimination Of Alcohol: Cumulative Results Of Four Studies"**

Nizar K. Shajani  
 R.C.M.P. Forensic Laboratory  
 5201 Heather St.  
 Vancouver, B. C. V5Z 3L7  
 (604) 264-3436

BAC profiles, time to peak, and elimination rates are reported when alcohol was consumed by healthy men and women under different drinking situations. (1) Social drinking after a 2-3 hour fast. (2) Social drinking after a meal and a meal consumed during the drinking period. (3) Heavy drinking after a 3 hour fast and after a large meal. (4) Social consumption of champagne after a 3 hour fast and heavy drinking of champagne after a large meal. Breath samples were analyzed by Breathalyzer Models 900 and 900A. Mean time to peak BAC was 27 minutes with 82% of the subjects reaching peak BAC in 40 minutes. Mean elimination rate was 19.4 mg%/hr. In heavy drinking situations, plateauing was observed in 68% of the subjects.

**"Shooting Scene Reconstruction"**

Raymond J. Davis  
Quantum Analytical Laboratory  
150 12th Ave., Suite 5  
Seattle, WA 98122  
(206) 621-1264

This presentation will cover some amazing and not to be believed facts surrounding this first degree assault case. Forensic scientists must be vigilant in seeking the truth even when engaging in the most straight forward case. Not the truth that best fits a particular theory in a case but rather the truth of what really occurred. Prosecution and defense attorneys often seek the best possible theory for their cases; bending, molding, and stretching the truth to best fit the facts in the case.

The case at hand involves juveniles and handguns. This case was quickly "solved" by the sheriffs office and written up as a first degree assault case without once looking at how this shooting actually took place. This writer had the opportunity to examine physical evidence which had not been submitted to the crime laboratory first. My examination and reconstruction of this shooting incident cast doubt on who actually shot the victim. A description of the elements of this assault case as well as my reconstruction will be presented. What transpired after my tests and expert testimony at trial will be the focus of this presentation.

**"Estimating BAC After Bolus Ingestion of Alcohol: Three Case Studies"**

Raymond J. Davis  
Quantum Analytical Laboratory  
150 12th Ave., Suite 5  
Seattle, WA 98122  
(206) 621-1264

Many states have case law admitting evidence of breath/blood alcohol tests anywhere from 1-3 hours after the offense of DUI. For the majority of the drinking driving population who consume alcohol in a steady (normal?) manner, determining BAC at the time of the driving usually doesn't present too much of a challenge. Unless of course the BAC happens to be at the statutory limit. Argument can be made that the defendants BAC was below the statutory limit at the time of driving given the fact that the defendant had a "double" for the long ride home. In any event, this doesn't prevent the prosecutor from showing that the defendant was obviously affected by the alcohol consumed regardless of the BAC.

Three case studies will be presented which have revealed to this writer that the normal absorption curves encountered in controlled drinking experiments do not apply when the bolus ingestion of alcohol is encountered. Several studies on the bolus ingestion of alcohol typically use 0.5-1.0g of ethanol/kg of body weight in a short (10-30 minute) drinking period, producing BAC's around 0-10%. These three defendants on the other hand, consumed 14 ounces of 80 proof, 9 ounces of 86 proof, and 15 ounces of 80 proof spirits in 20, 5 and 10 minute time periods and were given breath alcohol tests 126, 90, and 150 minutes after their arrest for DUI respectively.

Controlled drinking experiments were conducted on the first two defendants and expert testimony was provided in all three cases. Results of the drinking experiments as well as the testimony of expert witness at the DUI trials will be discussed.

**"Anti-HIV Compounds in Clandestine Laboratory Investigations"**

Jerry Massetti  
California Dept. Of Justice  
6014 N. Cedar Ave.  
Fresno, CA 93710  
(209) 278-7732

Anti-HIV drugs and precursor compounds are associated with clandestine laboratory processes on several levels. Physicians refer desperate patients to "buyers clubs" to obtain unapproved drugs. A former MDA and methamphetamine cook converts his laboratory to the production of anti-HIV precursor compounds. A defense counsel contends his client, charged with methamphetamine manufacturing, was actually producing dextran sulfate which has been used in AIDS therapy. In anticipation of encountering these compounds in clandestine laboratory investigations, a bibliography of some relevant syntheses has been started.

**"Overview of the National Judicial College"**

Robert P. Scherle, Academic Director  
Dr. Dick Bjur

The National Judicial College  
University of Nevada  
Reno, NV 89557  
(702) 784-6747; 800-25-JUDGE

(No abstract submitted) An overview of the judicial college was presented with emphasis on a course for judges concerning the admission of physical evidence, including DNA analysis.

**"Tetramethylbenzidine to the Rescue"**

Ed Shipp

Washoe Co. Sheriff's Office  
 Forensic Science Division  
 911 Parr Blvd.  
 Reno, NV 89512  
 (702) 328-2800

This presentation will discuss the use of Tetramethylbenzidine (TMB) in a recent homicide investigation. The working formulation will be given and even though TMB is considered a possible carcinogen, with the proper safety precautions, it can be used as an effective investigative tool. In this investigation, TMB successfully enhanced a barely visible shoe print to the point where class characteristics could be identified and photographed under normal conditions.

## AMERICAN BOARD OF CRIMINALISTICS AND CERTIFICATION ANSWERS TO COMMONLY ASKED QUESTIONS

This summary provides background information on ABC's goals and structure, and an update on recent certification events. It also explains how ASCLD/LAB Accreditation and ABC Certification compliment each other.

**What is the American Board of Criminalistics (ABC)?**

The ABC is a corporation formed to develop and to administer a forensic science certification program. The corporation consists of the American Academy of Forensic Sciences Criminalistics Section, California Association of Criminalists, Mid-Atlantic Association of Forensic Scientists, Midwest Association of Forensic Scientists, Northeastern Association of Forensic Scientists, and Southern Association of Forensic Scientists.

**What is Certification?**

Certification is a voluntary process of peer review where a practicing forensic scientist is recognized for attaining the minimum qualifications needed to practice one or more forensic specialties. It is designed to establish minimum levels of knowledge, skill, and ability, and to promote growth and training within the profession.

**How does it differ from ASCLD/LAB Laboratory Accreditation?**

They are complimentary. ASCLD/LAB focuses on laboratory administration and the processes needed to run a professional forensic laboratory. ABC and Certification deal with the minimum level of knowledge persons require in forensics and their specialty areas.

The recently developed ASCLD/LAB Business Plan calls for integrating Accreditation and Certification standards. ASCLD/LAB and ABC have agreed to begin working together on common issues (i.e. drug analysts qualifications and drug proficiency testing procedures).

**What is ASCLD's view of certification?**

The American Society of Crime Laboratory Directors (ASCLD) and ABC did not get off to a good start. There was misunderstanding and poor communication, but now we are beginning a dialogue. The ASCLD membership voted to appoint a liaison to the ABC to report on ABC activities and progress. Cliff Vander Ark, ASCLD Board Member and former Chair, ASCLD/LAB, is the liaison. There are a number of common issues that ASCLD and ABC can consider together (i.e. standard examiner qualifications, similar job descriptions, training, etc.).

**What is a Diplomate of the American Board of Criminalistics?...a Fellow of the American Board of Criminalistics?**

Diplomate with Certificate of Professional Competency in Criminalistics will be awarded to those who successfully complete the General Knowledge Examination and would not generally be eligible to be certified in a specialty area (i.e. supervisors and educators) or where Specialty Examinations are not available (i.e. soil comparison and ink analysis).

Fellow will be awarded to those who successfully complete both the General Knowledge Examination and at least one Specialty Examination and meet proficiency testing standards. The Fellow certificate will list the areas of specialization.

**Is proficiency testing required?**

Yes, proficiency testing is required in your Specialty area(s) to become a Fellow. Proficiency testing criteria are still being developed. Every effort will be made to use existing test mechanisms, to minimize cost and to prevent redundant testing (e.g. Accreditation and Certification).

**Who is developing the certification examinations?**

Each Member Association has a representative on the Examinations Committee. This Committee is responsible for developing, validating, and administering the examinations.

The examination questions are being developed by Peer Groups throughout the country. There are Peer Groups in each specialty area (fire debris, drug analysis, forensic biology, paints/polymers, hairs and fibers) in most regions. The groups consist of volunteers who work in these specialties.

**How are the tests validated?**

The Educational Testing Service reviewed the General Knowledge Exam. Questions were modified or eliminated based on their analysis. Similar analysis is planned for the Specialty Exams. All the exams will be graded and statistically evaluated by a testing service.

**How often do I have to be recertified?**

Recertification is required every five (5) years. A minimum number of continuing education and professional involvement points must be accumulated. If you are not able to meet the point minimum, you may take the current version of the General and Specialty examinations.

**How much will Certification cost me?**

We are making every effort to keep cost to a minimum. Developing properly structured examinations and administration processes is expensive. Our target is \$150 to sit for the General Knowledge Examination and one or more Specialty Examination(s) of your choice.

**Developing a national program is expensive. Who is paying for it?**

Member Regional Associations are supporting the ABC by funding Board and Examination Member travel. The California Association of Criminalists has paid for the professional test development help from ETS and others. Others have made donations of money and time.

The ABC is applying for an NIJ grant and other funding this year. The Educational Testing Service is helping to draft the proposal. The grant will be used to finalize and validate the Specialty Examinations. This will include bringing Peer Group Chairs together to finalize Specialty examination questions.

**How do I apply to take the Examinations?**

A brochure describing the Certification Program and the application process will be available later this year. Request forms for application packets and study guides will be included in mailings later this year.

**How can I find out more or get involved?**

Contact the NWAFFS representative to ABC - Dale Mann, Washington State Patrol Tacoma Crime Laboratory - (206) 593-2006.

You can also write to the American Board of Criminalistics, PO 209, Greenlawn, NY 11740-0209 for a copy of the Certification Program.

*SUMMARY OF THE FEBRUARY BOARD MEETING OF THE AMERICAN BOARD OF CRIMINALISTICS UPDATE***American Society of Crime Laboratory Directors (ASCLD) and ABC Begin Dialogue**

The ASCLD membership voted to appoint a liaison to the ABC to report on ABC activities and progress. Cliff Vander Ark, ASCLD Board Member and former Chair, ASCLD-LAB, is the liaison.

**ASCLD-LAB Accreditation and ABC Certification Complimentary**

The recently developed ASCLD/LAB Strategic Plan calls for integrating Accreditation and Certification standards. ASCLD/LAB and ABC have agreed to begin working together on common issues (i.e. drug analysts qualifications and drug proficiency testing procedures).

**General Knowledge and Examination Modified**

The Educational Testing Service (ETS), a nationally renowned test development organization, and the ABC Examinations Committee revised the CAC Criminalistics examination to remove CA specific questions and make it more nationally representative.

**Examination Offerings-General Knowledge (Boston 1993); Specialty (San Antonio 1994)**

Applications and Study Guide will be available later in the year.

**Fellow and Diplomate Status to be Awarded**

Diplomate with Certificate of Professional Competency in Criminalistics will be awarded to those who successfully complete the General Knowledge Examination and would not generally be eligible to be certified in a specialty area (i.e. supervisors; educators) or where Specialty Examinations are not available (i.e. soil comparison; ink analysis).

Fellow will be awarded to those who successfully complete both the General Knowledge Examination and one or more Specialty Examination(s) and meet proficiency testing standards.

**American Academy of Forensic Sciences Criminalistics Section Votes to Join ABC**

The Criminalistics Section surveyed its members on the ABC and certification — 78% responding wanted to join ABC. At their business meeting the AAFS Criminalistics Section voted to apply for ABC membership.



### Work Begins with the Forensic Science Service (UK)

The UK government is actively encouraging the development of vocational qualifications for all jobs. The Forensic Science Service (FSS) is taking the lead in developing qualifications for the Forensic Science Sector. The FSS has appointed a liaison to the ABC. Development information is being shared, including qualification standards and KSAs. Future plans may involve shared proficiency testing and pilot testing.

### Excellent Return on ABC Survey

Approximately 20% of the surveys were returned, which is excellent for a mailed survey. Seventy-seven percent said they will or may apply for certification. The ABC is using the data to validate and fine tune the Certification Program. A complete response to the surveys will be printed in this newsletter when it is completed.

### Grant Applications

The ABC is applying for an NIJ grant and other funding this year. The Educational Testing Service is helping to draft the proposal. The grant will be used to finalize and validate the Specialty Examinations.

### ABC Sets Membership Dues

The ABC Board voted to initiate \$400/year dues for each Member Organization. Operating expenses, including printing, postage, copying, and administration, have reached the point where dues are needed.

## AMERICAN BOARD OF CRIMINALISTICS SURVEY RESULTS RESPONSE TO THE FORENSIC COMMUNITY

### Part I - Program Questions Answered

This is the first in a series of reports on the results of the recent American Board of Criminalistics (ABC) survey. The survey was designed to get input on key items in the ABC Certification Program. Part I addresses specific questions raised by the respondents and clarifies select items in the Certification Program. Thanks to everyone who took the time to respond, and special thanks to those who provided the many thoughtful comments and suggestions.

There was a 20% response rate (2370 surveys distributed with 470 replies). This is a good return for a largely mail-in survey. A complete breakdown of numerical data will be provided in Part II of the report on the ABC survey.

### Background

A 23-question survey was distributed to the members of six (6) Regional Forensic Associations (California Association of Criminalists, Mid-Atlantic Association of Forensic Scientists, Midwest Association of Forensic Scientists, Northeastern Association of Forensic Scientists, Northwestern Association of Forensic Scientists, and Southern Association of Forensic Scientists), to American Society of Crime Laboratory Directors (September 1991 Meeting), and to members of the Canadian Society of Forensic Sciences.

The results of the American Board of Criminalistics certification program survey have been tabulated. The results for your regional organization are presented as well as the combined results for all responses. The response rate for each organization is: CAC - 13%; CSFS - 11%; MAAFS - 14%; MAFS - 23%; NEAFS - 10%; NWAFS - 5%; and SAFS - 15%. The ABC thanks all of those who took the time to let us know their feelings on the Program Draft and would like to take this opportunity to review some of the most important aspects of the forensic community's response.

## Survey Questions

### Certification Costs

*What should be Initial Administration and Examination Fees?*

The majority of you told us that a fee of \$100-\$150 for the initial certification testing is reasonable. We realize that there is point where the cost will prevent you from applying for Certification. ABC's goal is to keep the fee as low as possible without sacrificing quality and will do everything we can to keep the cost "reasonable" and not price ourselves out of the market.

*Is a yearly maintenance fee appropriate?*

There was almost an even split on having an annual maintenance fee. A significant reason for opposing the fee was you did not know what you would be getting for the fee. The ABC will design a system to cover the costs in the initial fees and when you recertify every five years.

## PROGRAM STRUCTURE

### Qualifications

*What items should be submitted with the Certification application - resume, transcripts, copy of degree, two letters of reference?*

Overwhelmingly you agreed that transcripts should not be required. ABC will require a resume that addresses specific areas - e.g. training and experience. A copy of the highest degree attained and two letters of reference will also be required.

*What is the minimum education required? Should Grandfathering be allowed?*

The ABC agrees with the respondents on the topics of minimum educational requirements and grandfathering (2 to 1 against). A minimum of a Bachelors degree in any natural science will be required for Certification and Grandfathering will not be allowed.

*What is the minimum number of years of full-time experience required for Certification?*

Most of you felt that two (2) or more years of full-time experience, including on-the-job training, was reasonable. This agrees with the proposal in the Program Draft.

*Should court qualification be required for Certification?*

Most of you felt that court qualification was desirable. However, the Board recognizes that this requirement might be a "Catch-22" (testify before certify or certify before testify). The Courts are going to decide who is allowed to testify as an expert. As Certification develops, it will be one more factor the judge and jury can weigh. The ABC has decided to delete court qualification as a requirement.

**Proficiency Testing***Should Proficiency Testing in your specialty be required for Certification? How often?*

Overwhelmingly you said yes (almost 7 to 1). Not only do you want to prove proficiency, you want to do it regularly, every 12-24 months. The ABC is pursuing ways of obtaining high quality, real-life proficiency tests, and plans to work with the American Society of Crime Laboratory Directors (ASCLD). The ABC is working on making proficiency testing standards consistent (i.e. accreditation and certification) and preventing duplication of effort and cost. Proficiency tests a number of us take now should not have to be duplicated for Certification.

**Recertification***Would you qualify for recertification using the continuing education/professional development point structure outlined?*

Approximately 70% said you could recertify with your current professional activity level. The same number feels the point system gives you ample opportunities and the degree of difficulty is about right. A number of persons offered good ideas on fine tuning the point structure, ranging from more credit for casework to staying up with the literature. The ABC will "tweak" the structure using your ideas, but it will stay largely as in the program.

Taking the current version of the General Knowledge and Specialty Examination(s) will be a recertification option, if you can not acquire sufficient points during the five (5) years.

**Future Additional Specialty Examinations***What other specialties would you like to see covered?*

Blood alcohol, followed closely by gunshot residue, are the two (2) areas most of you would like to see covered by Certification. ABC will use this data to develop the next specialty areas.

*Will you apply for Certification?*

Only 23% said they would not apply for Certification. The most prevalent reason for not applying was cost. A number of you want to see "what my Lab Director thinks," "if it is required," or "if the Department will pay for it." These are all very real concerns. The ABC is encouraged by the low number who said "no" to Certification and the number of positive comments about the program structure. We realize, also, that many want to see the final product and how the program goes before making your decision.

*COMMENTS RECEIVED VIA THE SURVEY ON CERTIFICATION*

*Listed below are representative comments about Certification. More will be provided in Part II of the Survey Response along with responses to more questions. The ABC tried to answer a number of individual concerns with the response to the survey questions above:*

If ASCLD does not support certification along with laboratory accreditation, then this program will not help the analyst obtain training or time and money to get certified.

I do very much like the emphasis on continued education that the recertification requires. I think it is badly needed by many old timers (myself included), but it also tells employers that ongoing education is absolutely necessary.

Convince me that the ABC represents my concerns and not what a small group of people and California thinks I need in my profession.

I am not in favor of certification, and I resent having it forced on me.

What's good for the goose is good for the gander. The laboratory director and all supervisors should be subject to certification - they should pass the general, any specialty area they supervise, and meet recertification point requirements.

Slow down the process!! Obtain support from other forensic groups. Listen to the bench people. What are you going to do with lab managers?

After a rocky beginning, the committee has done a superior job pulling everything together for a truly professional program without self-interest, at least obvious ones, apparent. Congratulations.

*GENERAL KNOWLEDGE SKILLS AND ABILITIES (KSAs) AS ADOPTED BY THE ABC*

These are the fundamental KSAs an individual must have to successfully take the General Examination of Criminalistics offered by the ABC. These were developed by the Examination Committee and Regional Peer Groups. Preliminary KSAs for specific areas of criminalistics (serology, drugs, trace, etc.) are also now available. Contact Dale Mann if you would like a copy. These will be published later when the initial offering of the specialty examinations is near.

To successfully take the ABC General Examination of Criminalistics, the candidate should have the knowledge of..., possess the skill to..., or have the ability to...:

**I. Evidence Collection and Preservation**

- A. Select and use the appropriate tools for recording and recovering evidence without loss, contamination, or changes that would result in the loss of information.
- B. The evidence potential of various items and how to safeguard that potential by proper sampling and control collection.
- C. Proper marking, packaging, and storage of evidence.
- D. Legal decisions relating to the preservation of evidence.
- E. Changes caused by time, temperature, and biological agents to evidence and the means to retard or prevent such changes.

**II. Evidence Examination and Data Interpretation**

- A. Types of measurements, procedures, and tests commonly used in the examination of physical evidence and the nature and significance of the information derived.
- B. To think logically and to design a testing protocol that will provide the most useful information while avoiding procedures that are redundant, unnecessarily consumptive, or will interfere with subsequent tests.
- C. The properties of commonly encountered evidence materials that allow their characterization.
- D. Limitations in personal skills and laboratory resources and the potential contributions of other expertise.
- E. Scientific method and general foundational basis for examinations, evaluation, and interpretations.
- F. The understanding and interpretation of technical data including any conditions or circumstances that could effect the conclusions.
- G. Logical thinking processes.
- H. Recognition of discrepancies or inconsistencies in analytical findings and determine their cause and significance.

**III. Laboratory Safety**

- A. The dangers associated with firearms, explosives, biological materials, and chemical substances and the proper methods for safe handling.

**IV. Instrumental/Equipment Usage**

- A. Instrument and equipment used at crime scenes and in the laboratory including their application and principles of operation.
- B. Instrument use based on the size and condition of the sample to be examined.
- C. Various isolation and separation techniques as required for sample preparation and/or application.

**V. Communication - Report Writing**

- A. Clear, grammatically correct, and concise written reports on analyses performed.
- B. Proper maintenance and recording examination information.

**VI. Communication - Legal Aspects and Court Testimony**

- A. Court decisions, procedures, and associated legal terms applies to expert witnesses.
- B. Understand and respond appropriately to questions from counsel and/or the court.

**VII. Rules of Professional Conduct and Code of Ethics**

(The Rules of Ethics as drafted by the American Board of Criminalistics.)

**VIII. Forensic Science and Other Applicable Literature**

- A. Current criminalistic information (via journals, books, newsletters, professional organization).
- B. Critically evaluate new, old, written, or oral information as to its value.
- C. Foundational basis of criminalistics.

*RULES OF PROFESSIONAL CONDUCT*

The ABC has established comprehensive Rules of Professional Conduct and an enforcement mechanism. In general, Certificates granted and issued by the Board may be denied, suspended, or revoked for any of the following reasons:

1. Misstatement, misrepresentation, concealment or omission of a material fact or facts in an application or other communication to the Board or its representatives.
2. Conviction of an applicant for certification or a holder of a certificate of the Board by a court of competent jurisdiction of a felony.
3. Issuance of a certificate contrary to or in violation of any of the laws, standards, rules or regulations governing the Board and its certification programs at the time of its issuance; or determination that the person certified was not, in fact, eligible to receive such certification at the time of its issuance.
4. Unethical conduct or other conduct by an applicant or holder of a certificate of the Board, which in the judgement of the Board, brings the profession of criminalistics into disrepute.

## FROM THE CANADIAN SOCIETY OF FORENSIC SCIENCES

### DURABILITY OF INDENTATIONS??

BARRY HUTSEL  
DOCUMENT SECTION  
R.C.M. POLICE FORENSIC LABORATORY  
WINNIPEG, MANITOBA

How long does indented writing in paper last? I don't mean to ask what might be considered a foolish question, but really, does anyone actually know if there is a limit to how long after their creation indentations in paper remain detectable using the Electro-Static Detection Apparatus (ESDA). I have no reason to believe that the ultimate limit depends on anything other than the physical durability of the paper itself and its storage conditions, but what is that limit, 2 years, 10 years, 100 years?

Recently I had an opportunity to examine a relatively old document for the presence of indentations. The document (an unruled note pad) was originally associated with an actual case dating back to 1977 (prior to the introduction of the ESDA in the RCMP Document Sections and indeed, prior to the invention of the ESDA in 1977-78 by Freeman and Morantz at the London College of Printing [1]). The matter which resulted in the submission of this exhibit to the Laboratory was concluded prior to any examinations being conducted, however, the exhibit was retained at the Laboratory for use as a possible training exercise for future understudies.

Upon my arrival as an understudy at the Laboratory in 1979 this document was transferred to me along with very oblique instructions to "see what you can find". Obviously I was unable to "find" anything and the document was placed into my safe for possible future analysis (not unlike the futuristic prospect of suspended animation which may be used to "freeze" humans suffering from incurable diseases in the hope that cures will be discovered before they are revived). During a recent "house cleaning" I located the exhibit at the bottom of a file drawer and decided to employ the newly developed "cure" and "see what I could find."

The document was the top page of a standard unruled note pad of white bond paper and it was suspected that bookmaking information had been written on the previous sheet of paper in the note pad. I conducted a standard ESDA examination, humidifying the sheet for about 5 minutes prior to analysis. The results were positive, however, because of limited time, I have not accurately deciphered the entire text (be my guest).

This exercise has successfully demonstrated that, as we all probably suspected, indentations in paper are detectable by ESDA examination many years after their initial creation. This analysis has shown that, for this type of paper, the limit is at least 14 years. Can anyone produce evidence that would expand the edge of this detection-time envelope or are there any comments on possible factors which may limit the durability of indentations in paper?

Just thinking . . . .

After completing work on the above material I checked the RCMP Police literature data base and discovered one other reference to the durability of the ESDA image (2). In this study, the backs of old envelopes were examined for the presence of indentations produced by the writing of the address on the front. Indentations created by ballpoint writing as far back as 1948 (near the invention of the ballpoint pen) were detected and indentations created by pencil writing over 60 years ago were also easily detected. The authors were unable, however, to detect indentations of fountain pen impressions created before 1950 and no typewriter impressions were detected.

1. "An Electrostatic Imaging Technique for the Detection of Indented Impressions in Documents", by D.J. Foster and D.J. Morantz, Pub. *Forensic Science International*, Vol. 13, 1979, p. 51-54.
2. "How Long Will an ESDA Image Last", by George J. Horan and James J. Horan, Presented at the *International Association of Forensic Science Meeting*, August 1987 and at the *American Academy of Forensic Sciences Meeting*, February 1988.

### GUIDELINES IN PREPARING 35MM SLIDES

ACADEMY NEWS  
SEPTEMBER 1991, P. 3

The following are some points to consider when preparing 35mm slides for presentations of all kinds:

- Limit the information on each slide to a single point or idea.
- Keep slides simple with plenty of open space. Space between lines should be at least the height of capital letters.
- Limit messages to seven lines or less. Do not use more than seven words per line.
- Do not crowd the slide. Two or more simple slides are better than seven words per line.
- A good rule of thumb is if you can read the information on your slide held at arm's length against a bright background, then it will be readable to your audience.
- **Simplify-simplify-simplify:** Your entire presentation should not be on the slides. The slides should support your talk and add emphasis to your important points.

Following these guidelines will ensure that your audience will obtain the maximum benefit from your presentation.

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## STAY-CLEAN CAR PAINT

DAVID SCOTT  
 POPULAR SCIENCE MAGAZINE  
 NOVEMBER, 1991, P. 43

Nissan has developed a stay-clean auto body paint that minimizes adhesion of traffic grime, soot, and water-borne dirt and also resists scratching and chipping. With this new technology the clear final coat gives a much harder finish than that now available, says Nissan. The material currently in use is a mixture of acrylic and melamine resins, with the melamine being the hardening agent. Nissan's new formulation combines carboxyl and epoxy resins that react chemically to produce an unusually high-density, uniform coating after baking and hardening.

The resulting surface has microscopic texturing comparable to machine polishing, providing little grip for dirt, atmospheric pollution, or even bird droppings. The first application of the new paint will be on selected Nissan cars for the Japanese market, with export markets to follow.

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## UNUSUAL GARMENT TEAR

Dear Editor:

I read with much interest the letter published in the June 1991 issue of the *Forum* from Ray Wickenheiser, seeking assistance in the interpretation of textile damage.

In my experience as an examiner in a number of assault and rape cases I have found that it is useful to evaluate any item of clothing at three different levels.

Firstly, through gross examination of the item of clothing with the naked eye it is important to undertake a complete analysis of the garment, identifying its various components, classifying the types of stitches and seams and confirming the method(s) of closure if relevant. In addition one should determine those components which are missing, find the seams which have been stressed or have failed, locate any holes, distorted areas and the general direction of tears.

Secondly, by using a low power optical microscope at less than 4x50 magnification one can determine the characteristics of the damaged seams and textile structures. One may be able to assess which sewing thread in a seam or which yarn in a knitted or woven structure broke first. Following the failure of a thread or a yarn it is usually possible to evaluate the extent and direction of fraying or ravelling. Such observations can assist one in estimating the maximum stress levels and the directions in which those stresses were experienced by the garment.

The third level of analysis involves the use of an optical bright field microscope at x400-x600 magnification or the use of a scanning electron microscope to examine the sections and surfaces of individual fibres. Of particular interest is the fracture morphology of broken and damaged fibres. Identification of the type and shape of the fracture planes can often explain the type and extent of previous damage due to wear, as well as whether the fibre failure was ultimately due to tensile, torsional, bending, shearing or abrasive stresses.

From these three independent sets of observations it should be possible to build a complete picture of the former condition of the item of clothing as well as an explanation of how the overt damage was caused. It is important to remember that a piece of clothing is not a random, isotropic array of fibres, but an engineered multi-component product with different fabrics, layers, trim, closures, thread and seams that each respond in their individual way to a particular applied mechanical, chemical, biological or thermal stress.

With reference to the two particular observations reported by Ray Wickenheiser, they appear to be totally unrelated. It is evident that a more detailed examination at each of the three levels discussed above would be valuable in determining whether the separation (run?) in the knitted fabric was associated with the apparent melting of individual fibre ends, or whether these two characteristics were due to two totally different stress histories.

I would also propose the use of fibre identification, melting point and DSC analysis of all components and sewing threads found in the garment before a realistic conclusion might be drawn.

I would welcome comments from other examiners who have forensic experience in analyzing textile structures and clothing items.

Sincerely,

Martin W. King,  
Associate Professor  
Faculty of Human Ecology  
University of Manitoba

**Mr. Wickenheiser Replies:**

My letter was intended to solicit experiences of similar damage in case material and to request hypotheses on potential causes. I concede that the initial information provided was quite preliminary, however, I had instructed a colleague, to whom the exhibit was transferred for an unrelated analysis, for its eventual return in order to carry out additional examinations. Unfortu-

nately, the charges in this case were subsequently dropped and, contrary to my instructions, the exhibit was returned to the investigator by my colleague and tragically destroyed, one day prior to my follow-up phone call.

I agree with and practice methodology quite similar to that outlined by Prof. King, although I do not have an SEM at my disposal. It is also my opinion that the two observations likely originated from two separate occurrences, although at this point the appropriate additional analysis is impossible. It was my intention at the time of my initial letter to the *FORUM* to include this unusual case history within the framework of a larger article, including additional forensic case histories, and methodology, such as that practised in routine forensic examinations.

I join with Prof. King in welcoming comments from other forensic examiners on this topic, and am particularly interested in their casework experiences and methodologies.

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## BAD SCIENCE

DEAN H. GARRISON, JR.  
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*This article was first published in the October 1991 issue of the Midwestern Association of Forensic Science Newsletter and was re-printed here with the permission of the author.*

**"Science without conscience is the death of the sole."  
- Rabelais**

Forensic science is the product of an uneasy and unholy mating of Science, the objective seeker of truth and knowledge, and Forensics, the argumentative persuader of courtroom advocacy. It is not called Justice Science, Law Science or Truth Science, as many of us would like to imagine. We are a bastard child, an orphan, but still the subject of an intense child custody battle between our estranged parents, the truth seeker and the advocate. The tug of war goes on daily for our loyalties and confidences, each side offering candy and warm hugs. These separated parents have visitation rights. Sometimes they take our sisters and brothers away. Sometimes they don't come back.

We in forensic science like to think of ourselves as our mother's child--Mother Science, pure and incorruptible--and most of us start out this way. Some of us remain pure. Some grow up to be delinquents. The advocacy half of forensic science will not go away, it has weekday visitation rights and power of subpoena. It has advocate friends called prosecutors, attorneys, cops, the press and the Government. The advocates rarely understand the appeal of Mother Science, cannot fathom a search for truth in a game plan that calls for scores and trophies. They are constantly trying to persuade us to see it their way, to compromise, to bend a little. They don't realize it, but what the advocates are asking for is **BAD SCIENCE**.

The pressure to be a Bad Scientist, to fit in and go along, is great, and it doesn't go away unless you put your foot down and say Enough is Enough! And keep saying it to each supervisor, each detective, and each fair-haired boy from the prosecutor's office. Bad Science is what forensic science becomes when an attorney or prosecutor, who often display all the ethics of a full-grown hamster, get a forensic scientist to play ball, to get

with their program and see *their* big picture.

There is an old Bad Science joke about a scientist who was working with an ant. The scientist would cut off one of the ant's legs and shout "Jump!" And the ant would jump. The scientist cut off a second leg, told the ant to jump, and again the ant jumped. And so it went, until the scientist had cut off all six of the ant's legs. This time, when told to jump, the ant did not jump. This proves it, the scientist concluded; when you chop all the legs off an ant, the ant goes deaf!

You may recognize some scenes from the following examples of Bad Science at work. Some are laughable, others disturbing. Some simply haven't happened to you yet. I have not personally encountered all of these situations, but I know that each is true. If you haven't witnessed at least some of them, you will. If this helps you steel yourself against the onslaught of the Advocates, so be it. Finally, not all Advocates are malicious. Many, in fact, are simply not versed in the wars of good scientific method. When they ask for Bad Science, you can pity them as helpless people doing the wrong thing for the right reason. This type of Advocate needs to be taught . . . and watched.

#### *MISINTERPRETATION OF TEST RESULTS*

In a robbery case the victim, a bartender, testifies that the defendant had come into the tavern earlier in the night for a glass of beer. Three unwashed glasses were found at the scene and were processed for latent prints. Two of the glasses yielded prints, but these were from persons unknown, not the defendant. The prosecutor suggest that the print examiner testify that the third beer glass must have been used and wiped clean by the defendant, because the other two glasses were obviously not his. The print examiner suggests that the prosecutor look elsewhere for this kind of testimony. The prosecutor looks surprised.

#### *MANIPULATION OF RAW DATA*

An accident reconstruction expert with a computer is hired by a plaintiff's attorney to determine the speed of the defendant's vehicle in a two-car collision. The expert enters into his program the road surface drag factor, skid and yaw mark lengths, and the location and severity values of vehicle damage. The first run of his computer gives him an unrealistically high speed for the defendant's striking vehicle. The expert changes his drag factor estimate and tries again. The figures are still outrageous. Three program runs and several crush damage data changes later, the speed determination begins to look more believable. The defendant's attorney begins his attack with a subpoena for all five of the expert's computer print-outs.

#### *JEOPARDY*

As in the television game show where contestants reply in the form of a question, certain managers give their subordinates a desired answer and demand that they come up with the appropriate research questions to support it. During one police department's trial period of a 9mm pistol, a police officer

wounds an assault suspect. Because the suspect is not instantly incapacitated, the police chief scraps the entire 9mm changeover program. He hears of the FBI's 10mm pistol program, decides this is the answer, and assigns a police administrator to research the right questions to match his answer. The administrator goes to Quantico to learn of the FBI's 10mm pistol program. One of the theories he returns with states that, by virtue of its "larger size," the 10mm is much better at striking blood vessels than the smaller 9mm bullet. The department's shooting instructor points out that an extra half-millimetre alone on each side of the 10mm bullet's diameter would not really make much difference, unless you missed a blood vessel by half a millimetre with a 9mm bullet. Then the instructor begins his litany about the training budget, that training is at least as important as hardware, but the administrator doesn't hear him, because it's time to play Double Jeopardy with the Chief.

#### *COMPARING APPLES AND ORANGUTANS*

In a product liability suit, the plaintiff's attorney finds an expert witness who will testify that, if a shotgun involved in a shooting had as safe a firing mechanism as a rivet gun, the incident may not have happened at all.

#### *MANIPULATION OF TEST RESULTS*

During a burglary trial, the prosecution produces seven latent prints recovered from inside the victim's house. The fingerprint examiner testifies that he has identified these prints as belonging to the defendant. The prosecutor suggests that the fingerprints are like seven little photographs of the burglar inside the house. Because he does not want a repeat of an earlier case lost to the burglar's defense attorney, the prosecutor calls a second examiner to the stand to verify the comparison performed by the first. The prosecutor then states that the seven latent prints, times two print examiners, make for fourteen little photographs of the defendant at the crime scene. Later, when jokingly asked why he didn't call a third examiner to up the score to 21 fingerprints, the prosecutor replies that he had simply neglected to subpoena another print examiner.

#### *COMPULSIVE COMPUTING*

A .223 Remington bullet is found lodged in a house several hundred feet to the rear of a rifle practice range at which .223 weapons are frequently fired. The investigators want to know if it is possible for a .223 bullet to fly the several hundred feet necessary to reach the house, so they ask a firearms examiner. The examiner, who had recently invested in a ballistics program for his home computer, took down the range, wind speed, bullet shape, temperature, barometric pressure, and several other pieces of data. His computer printer charted the results. Finally, his answer to the investigators was: "Yes, it's possible." As a qualified firearms examiner, he had already known that the house was well within the range of the .223 cartridge and could have given the same answer when first asked the question - without computation.

*DENIAL*

In many major criminal investigations it is the practice of a detective unit to offer polygraph examinations to the suspects and, in cases of questionable accusations, to the victims. While it is not admissible in court, the polygraph results are relied upon as a valid investigative tool. One day a young police officer shoots and wounds a juvenile who he claims fired at him first, although no weapon is found. The officer claims he was also struck several times about the head and shoulders with a board prior to the shooting, although he exhibits no bruises, head injuries, or defense injuries to his hands or arms. When asked about this lack of consistent injuries, a detective reports that the young officer was wearing a bullet-resistant vest. The detectives do not offer the suspect or the police officer polygraph examinations in this particular case.

*ETHICAL BANKRUPTCY*

In a homicide case the prosecution demonstrates a laser reconstruction of a bullet's path through a woman which indicates her husband fired a rifle from his shoulder. The husband's story is that he was cleaning the weapon while it lay on a tabletop. The defense attorney finds a firearms expert who will claim that, while the weapon was not malfunctioning before the incident, was not malfunctioning when collected from the crime scene, and is not malfunctioning now at time of trial, it may have suddenly malfunctioned and fired all by itself as a result of a build-up of dirt and powder within the weapon's mechanism on the day of the shooting. The expert does not address the issue of shooting reconstruction, but the jury does and returns a guilty verdict.

*NO SCIENTIFIC METHODOLOGY*

A city truck runs a stop sign and causes a serious collision. Instead of relying on the skid marks, crush damage, and scene evidence, the city authorities order a traffic investigator to conduct acceleration tests to determine the maximum possible speed the truck driver could have achieved in the one block distance leading up to the crash. Because the truck involved was disabled in the accident, the traffic investigator uses a motorcycle to run the one-block acceleration test and reports back a peak speed of 35 miles-per-hour for the city truck.

*TOO MANY COOKS SPOIL THE BROTH*

A city bus rear-ends and crushes a carload of teenagers, killing four. The first traffic investigators at the scene measure the skid marks of the bus and determine that the bus driver was speeding. A national civil rights leader says the bus driver is being made a scapegoat by the city solely because he is a minority. The following investigation by city authorities reports that the traffic investigators, who have been abruptly removed from the case, must have been measuring tire marks tracked through melted roadway tar and that, on second thought, the city bus driver was not really speeding. A local television station gets

a radar gun and reports that most drivers, including all city bus drivers, regularly exceed the speed limit on this section of roadway. Tire tracks in tar look nothing like skid marks to the trained eye of the traffic investigator. Excessive speed aside, it is unlawful to follow another vehicle at an unsafe distance in that state.

*PURSUIT OF THE INCONSEQUENTIAL*

In the faked robbery of a fast food restaurant, the night manager shoots to death an employee in a walk-in cooler, hides the "stolen" money and a .357 Magnum revolver, and calls the police. The crime scene personnel notice fallen dust on a restroom floor and discover the money hidden in a ceiling panel. The revolver is found among the night manager's possessions. During the investigation, the prosecutor asks for a shooting sound test to be done inside the restaurant's cooler. This, he says, will determine whether or not the fatal shots could have been heard by a teen-age girl who was having sex with a man (not her boyfriend) in the back of her boyfriend's van parked across the street from the restaurant. The girl, who incidentally had a full-length cast on her leg at the time (another mystery altogether), did not recall hearing much of anything, least of all gunfire. Her partner that night had also missed the sounds. The crime scene investigator refused to participate in such an experiment, arguing that it was invalid, irrelevant and silly, and what would it prove anyway? The prosecutor suggested that the defense might use the fact that the girl had *not* heard the shots to argue that the time of the murder was somehow different. Then let the defense make a sound test, the investigator says, leaving. The prosecutor is insistent. After being turned down by the police firearms trainer and the state regional laboratory examiner, the prosecutor gets three detectives to fire the shots for the sound test. To duplicate the sounds of a .357 Magnum, they load the murder weapon with light .38 Special target loads; they fire the quieter ammunition into a sandbagged pipe inside the walk-in cooler so as not to make holes in the walls. It is several months later, and the air temperature is sixty degrees lower than the night of the murder. By the time the test begins, the noisy morning rush hour traffic has clogged the street in front of the restaurant. To duplicate the hearing of the busy girl with the cast on her leg and other things on her mind, they use the prosecutor's ears as he stands across the street (later there were several profane allegations about what the prosecutor had to endure to fully recreate the event). The results of the test? "It sounded like a hand clap," said one of the detectives stationed in the dining room. So, apparently, one can induce deafness by making love to a girl in a full-length leg cast, the same as one can by cutting all six legs off an ant.

Examples of truly **Bad Science** are everywhere. So, what can one do to avoid ambush by the Bad Scientist? Three small philosophical exercises come to mind. The first is a methodological battle plan called "Ockham's Razor," named after the 14th century philosopher William of Ockham. In philosophy, it says, a problem should be stated in its basic and simplest terms. In science, according to Ockham's Razor, the theory that fits the facts of a problem with the fewest number of assumptions is the one that should be selected. This is the great-grandfather of the



K.I.S.S (Keep It Simple, Stupid) theory, and works well against Bad Scientists.

The second tactic is termed "reductio ad absurdum," which is the disproof of a proposition (or stupid experiment) by showing the absurdity to which it leads when carried out to its logical conclusion. A good example of such a situation is the aforementioned case of the prosecutor who argued that seven fingerprints identified by two print examiners make a total of fourteen little traces of the burglar defendant. The reductio ad absurdum of that case is the notion that a third print examiner would up the ante to 21 clues, or that a dozen examiners identifying a single print would make for 12 traces of a suspect. The clues multiply like bunny rabbits. The mind boggles. Think of where the Bad Scientist is trying to lead you and look at the dark at the end of the tunnel.

The final fall-back is to common sense, the bane of Bad Scientists the world over. It was Thomas Huxley who said, "Science is simply common sense at its best - - that is, rigidly accurate in observation and merciless to fallacy in logic." This is where juries trod on the best laid plans of eloquent attorneys. They step back for a moment and resort to instinct, to common

sense. Lawyers, especially those True Believers who do the prosecuting, are notoriously bad at feigning common sense. They are better at reductio ad absurdum. Cops, on the other hand, are excellent at instinct and common sense, but poor on seeing the absurdity of a proposition's logical conclusion.

Lastly, one needs to stand one's ground. And this means more than just **Do Not Testify To Methods Beyond Your Expertise**, or **Do Not Selectively Ignore Evidence To The Contrary**, or **Do Not Overstate Your Qualifications**. Standing your ground means you have to get in the face of anyone who even *hints* at being a Bad Scientist. You'll need to gently redirect the novice Bad Scientist at times, showing him the light, letting him know where you stand. With the more seasoned advocates (prosecution or defense), you may need a chain saw to carve out your turf in the Bad Scientist's office, be it a medical examiner's office, a lawyer's office or a supervisor's office. Draw the line. Let them know when **Enough is Enough**. After all, you're the bastard child of both Science and Forensics. They'll expect you to be incorrigible. Don't let them down. J. Robert Oppenheimer said it best when he wrote: "The scientist is free, and must be free to ask any question, to doubt any assertion, to seek any evidence, to correct any errors."

